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A

FLORA OF GIBRALTAR

AND THE NEIGHBOURHOOD

BY

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A FLORA OF GIBRALTAR

AND THE NEIGHBOURHOOD.

By Major A. H. WOLLEY-DOD.

Introductory Note.

In the following list of plants recorded from Gibraltar and its neighbourhood I have divided the region into three districts, as follows:—

I. The British territory, *i.e.* the Rock itself and the North Front.
II. The Neutral Ground.
III. Spain, subdivided into three sub-districts—
  i. San Roque, as far as the Guadarranque River.
  ii. Algeciras, from the Palmones River to the sea.
  iii. Palmones, between the rivers.

The books consulted have been the following:—

Boissier, *Voyage Botanique dans le Midi de l'Espagne*, cited as *Voy. Bot.*; Kelaart, *Flora Calpensis*, cited as *K. Fl.*; Debeaux, *Flore de Gibraltar*, cited as *Deb. Fl.*; Perez Lara, *Florula Gaditana*, cited as *P. L. Fl.*; Frere, *Synopsis of the Flora of Gibraltar*, cited as *Frere*.

The following signs and abbreviations are used:—

* Denotes naturalized aliens. † Denotes species or varieties not recorded elsewhere in the Province of Cadiz. [ ] Denotes species which are excluded either as cultivated, casual, imperfectly naturalized, or incorrectly diagnosed. ? Denotes doubt as to the correctness of the name or of the occurrence of the species indicated in the station named. ! After a locality or a collector's name indicates that I have seen a specimen in that locality, or by that collector.

The following abbreviations have been adopted for names of collectors:—

Clem. = Clemente.
Clus. = Clusius.
Colm. = Colmeiro.
D. = Dautez.
Deb. = Debeaux.
Dur. = Durieu.
K. = Kelaart.
Lem. = Lemann.
Lge. = Lange.
Nilss. = Nilsson.
P. L. = Perez Lara.
Pourr. = Pourret.
Rev. = Reverchon.
Salzm. = Salzmann.
Wk. = Willkomm.
Winkl. = Winkler.

A fuller introduction will be issued on the completion of the Flora, when this Introductory Note may be cancelled.

Ranunculaceæ.

Clematis Flammula L. Bushy places and watercourses; rather frequent; 6–7. I. Engineer Road! III. i. Cork Woods! Arroyo Viejo! ii. Palmones Pinar! Carnero Hills! Mountains behind Algeciras! iii. Salt Pans! Near Los Barrios Station!

Var. *maritima* DC. has linear lanceolate leaflets. II. *D.*, not there now. III. i. Punta Mala, *D.* ii. Carnero Hills, probably this!

C. cirrhosa L. Bushy and rocky ground; very common on Rock; rather frequent in Spain; 11–1. I.! III. i. Cork Woods! Alcadeza Plains! Almendral, *K.* ii. Carnero Hills! Waterfall Valley!

†Var. *Dautezi* Deb. Flowers large, deep purple, marked inside with numerous black spots. I. Europa Point, Alameda, and other southern parts of the Rock, *K.*, *D.* I have never met anyone who has seen this. The petals in the type are sometimes reddish on the back.

Nigella hispanica L. Cultivated ground; rather frequent; 5–6. III. i. Campamento! Carteian Hills! Beyond San Roque! ii. Waterfall Valley!

N. damascena L. Similar places and bushy hills; much less frequent. I.? *K.* II. *K.*; probably same station. III. i. Cork Woods! Near first Pine Wood! Almendral! Pindalista! ii. Carnero Hills! Near Algeciras!

Delphinium peregrinum L. Sandy places; very common; 6–9. I use this name to cover species with the lateral petals either elliptical and narrowed into the claw, or suborbicular and truncate or subcordate below. For note on the species see Journ. Bot. 1914, p. 10.

Var. *confertum* Boiss. (*D. cardiopetalum* DC.) has a dense raceme, and appears rare. III. ii. Algeciras, *Schott*.

Var. *longipes* Boiss. (*D. junceum* DC., *D. gracile* DC.) has elongate lax racemes. I have seen it only with truncate or subcordate lateral petals. I.! II.! III.!

D. pentagynum Desf. Bushy and rocky places; rather frequent; 5–6. I. Upper Rock! III. i. San Roque! ii.! Reaches the Mountains.

D. Staphisagria DC. Similar places; rare; 5–6. I. *Dur.* III. i. Near Almoraima Station! iii. Near railway bridge over Guadarranque!

†*Ranunculus tripartitus* DC. Pools and streams; rare; 3–4. III. i. Running water on south slopes of Almoraima, *Wk.*! Willkomm's specimen at Kew has not the characteristic capillary submerged leaves; the floating leaves are deeply tripartite with bilobed segments. Wet places between San Roque and Linea, *Frere*.

R. dubius Freyn. Similar places; rare; 3–4. III. ii. or iii. Palmones River, *Rev.*

R. Drouetii Godr. Similar places; occasional; 2–5. Flowers

small. III. i. Puente Mayorga! Mill Soto! ii. By Palmones new road bridge! iii. Salt Pans!

R. peltatus Schrk. Similar places; rather frequent; 2–5. Flowers the largest of our species. III. i. Mill Soto, abundantly! ii. Roadside near Algeciras! Palmones Playazo! M. de la Torre! iii. Salt Pans! Railside near Los Barrios!

Var. *radiatus* Freyn has floating leaves with radiating segments. III. ii. Algeciras marshes, *Winkl.*

Var. *pseudofluitans* Freyn, lower leaves with long flaccid segments, usually none floating. III. ii. Algeciras marshes, *Winkl.*

Var. *truncatus* Hiern, floating leaves truncate at base. III. ii. Roadside towards Palmones Pinar! (teste *Groves*); a form with small flowers and capillary submerged leaves, near *R. tripartitus*.

R. bullatus L. Rocks and dry ground; locally plentiful; 10–12. I. About Willis's! Ince's Farm! By Charles V.'s Wall near Devil's Gap and Signal Station! North Front, *K.*; not there now. III. i. By Francia's Farm! In profusion near Malaga Gardens! Between San Roque and first Pine Wood! Alcadeza Plains! S. Carbonera, *D.*

†*R. blepharicarpos* Boiss. (*R. spicatus* Desf.? *R. rupestris* Guss. var.?). Carpel-bearing part of receptacle pilose (the lower petal-bearing part is often pilose in *R. flabellatus*), leaves reniform and deeply 3-lobed, the lobes again shallowly lobed or dentate; carpels with a very long beak. I. Europa Flats, near the Artillery Barracks, *Lem.*, *D.* III. i. S. Carbonera, *D.*; San Roque, *Dasoi*.

†*R. Winkleri* Freyn. Similar places; rare? 3–5. Near *R. flabellatus*, but radical leaves suborbicular and cordate, entire or tripartite. Apparently only an extreme form of that species. I. Signal Station Road! III. ii. S. de Palma, *Rev.* Near Algeciras Cemetery. Mountains above Pelayo!

R. flabellatus Desf. (*R. chærophyllus* DC.). Dry grassy places, among bushes, &c.; very common in Spain, occasional on Rock; 3–5. Though typically with oval leaves, more or less narrowed below, it certainly runs into forms described above, connecting it with *R. Winkleri*. My 627, from Signal Station Road, and 361 from Campo Common, are such forms. Thirteen varieties are described, but I cannot identify them, and cite the records of others.

Var. *genuinus* Freyn. I. North Front, *K.* III. i. San Roque, *Wk.* ii. Algeciras, *W.*, *Hack.*, *Winkl.*

†Var. *acinacilobus* Freyn. III. ii. S. de Palma, *Winkl.*

Var. *flavescens* Freyn. III. ii. S. de Palma, *Winkl.*

†Var. *gregarius* Freyn. III. ii. S. de Palma, *Winkl.*

†Var. *confertus* Freyn. III. i. Damp pastures at San Roque and S. Carbonera, *Winkl.* ii. Algeciras, *Winkl.*

Var. *mollis* Freyn. III. ii. Algeciras, *Dieck.* San Roque.

Var. *acutilobus* Freyn. III. i. Spanish Racecourse, *K.*, *D.* ii. S. de Palma, *Fritze.*

R. gramineus L. Dry grassy places; rare; 3–6. III. i. About Campamento, *K.*

†*R. ophioglossifolius* Vill. Marshes; rather frequent; 2–6. III. i. Cork Wood Sotos! Lajo Marshes! Sand desert below S. Carbonera, *Boiss.*, *Wk.*, *D.* ii. S. de Palma, *Winkl.* iii. Near Salt Pans! Between Guadacorte and Guadarranque River!

†*R. sceleratus* L. Marshes; rare; 2–5. III. i. Mill Soto; sparingly!

R. palustris Sm. Damp grassy places and stream beds; very common; 4–5. The aggregate covers the common species with large very hirsute leaves, but it varies much in hispidity, and to a less degree in leaf cutting.

Var. *macrophyllus* P. L. is the common variety, more or less densely clothed with yellowish hair, peduncles hairy, terete, sepals spreading or ascending, carpel beak recurved. My 1757, from near Cortijo Trinidad, is a peculiar variety with longly petiolulate central leaf-segments; it is like *R. Aleæ* Wk., but the root is hardly subbulbous. III.!

Var. *adscendens* P. L. Much more glabrous, leaves, especially upper, more cut into narrower segments; sepals more strongly reflexed. A very local variety. A distinction is made by many botanists between *R. adscendens* of Brotero's Fl. Lus. p. 370, and Phyt. Lus. ii. p. 229; but the author obviously intended these to be the same. There is, consequently, some confusion of names, and I suspect that Perez Lara's records of *R. Broteri* refer to var. *macrophyllus*. III. i. Soto behind Long Stables! (I believe this variety, but not collected). iii. Guadarranque marshes, plentiful!

[*R. Steveni* Andr. †var. *multifidus* Amo is recorded by Dautez from the Guadarranque marshes. The last-named variety, which he does not record, bears a superficial resemblance to it.]

R. trilobus Desf. Similar or drier situations; very common; 3–5. Usually glabrous, flowers half the size of those of *R. Sardous*. A dwarf form is found on the summit of the Frayle ridge at 2500 ft. or more. II.! III.!

[*R. Sardous* Cr. is recorded by Dautez from Neutral Ground and foot of S. Carbonera. Probably he mistook *R. trilobus* for it.]

R. parviflorus L. Shady banks and grassy places; locally frequent; 4–5. III. i. From Second Venta to Long Stables and Almoraima! ii. Between M. de la Torre and Palmones railway bridge! Mountains!

R. muricatus L. Damp grassy and marshy places; rather common; 3–5. II.! III.!

R. arvensis L. Cornfields; very common; 3–5. III.!

Ficaria ranunculoides Moench. var. *grandiflora* P. L. Marshy and damp fields and woods; very common; 12–4. Much larger than type, with conspicuously reticulate leaves. I have not seen type, nor has Perez Lara in the Province; but he cites Amo's record, "the neighbourhood of Gibraltar." II.! III.!

Adonis autumnalis L. Cornfields; rare; 4–5. III. i. Between San Roque and Alcadeza Crags!

Anemone palmata L. Dry heathy places and open parts of woods; rather common; 2–5. III. i. and ii.!

†*A. coronaria* L. forma *micrantha* Daut. & Deb. Woods; locally common; 3. Much more slender in all parts than type, leaves with narrower divisions; flowers smaller and deeper blue. III. i. Almoraima Woods, *Deb.* I have twice searched for it without success; it is doubtless very local. S. Carbonera, *Rev.*

Papaveraceæ.

[*Papaver somniferum* L. var. *setigerum* Boiss. occurs as an occasional escape, as on North Front and at Linea !]

P. Rhœas L. Cornfields, or undisturbed ground; rather common; 4–5. I.! III. i. and ii.! In occasional fields abundant!

P. dubium L. Similar places; much less frequent; 4–5, Starved specimens of the last are liable to be mistaken for it. I! III. i. and ii.!

[†*P. Argemone* L. is recorded by Kelaart for Gibraltar, but has not been confirmed.]

P. hybridum L. Cornfields and their borders; locally frequent; 4-5. I. Engineer Road! III. i. By First Pine Wood! Campamento! Carteian Hills! Magazine Hill! ii. In several places!

Glaucium luteum Scop. Sea shores, chiefly on the Rock; 4–5. I. Eastern and southern shores! Dockyard! Above Alameda (herb. Balestrino!) II.! III. ii. Carnero Point!

[*Rœmeria hybrida* DC. Waste places near the sea; casual? 4–6. III. i. Campamento, *Frere.*]

Fumariaceæ.

Fumaria capreolata L. Hedges and bushes; rather frequent; 2–5. Flowers creamy white with dark red tips, fruit pedicels recurved. I. Main Road from Charles V.'s Gate to Europa Pass! Engineer Road! North Front gardens! Reclamation Road! II.! III.!

Var. *speciosa* Hamm. Flowers turning deep crimson as soon as they open. III. i. Cachon! Shore near Puente Mayorga! Road to Bonel's Farm! iii. Between Guadarranque and Algeciras, *D.*

F. macrosepala Boiss. Bushy places; rare. Flowers pale, very large, sepals twice as broad as corolla, stem simple, hardly climbing. I. Under north-east precipice among Chamærops, *Boiss.*

[*F. malacitana* Haussn. Recorded by Dasoi from Gibraltar, but Mr. Pugsley thinks the determination untrustworthy.]

F. sepium B. & R. Hedges; rare; 2–5. Mr. Pugsley says that author's specimens of this are only shade grown *F. gaditana*, with narrow sepals and corolla, and bracts as long as pedicels; but the name takes priority as a species. III. ii. Hedges and walks north of Algeciras, *B. & R.* My 1711 from Algeciras Alameda, doubtless the station referred to, agrees with the type specimen (*teste* Pugsley)!

Var. *gaditana* Pugsley differs from *F. capreolata* in erect

pedicels and smaller flowers in a lax raceme. From other species it differs in very broad sepals, lax, usually few-flowered racemes, deflexed lower petal, and smoothish fruit. I.! III.! Common everywhere!

F. Bastardi Bor. Similar situations! rare; 2–5. Lower petals with spreading magins, upper laterally compressed, fruit subglobose. I. *Boiss.*, *D.* North Front Gardens! III. i. Road to Bonel's Farm!

[*F. muralis* Sond. and *F. Boræi* Jord. are reported from Gibraltar and San Roque. Mr. Pugsley thinks they are certainly forms of *F. sepium.*]

F. agraria Lag. Roadsides and hedges; locally frequent; 2-5. Like *F. capreolata* in yellowish colour of flowers, but they are larger, very broadly winged, pedicels erect or spreading, and fruit large, coarsely rugose. I. Bruce's and Ince's Farms! III. i. Linea! Campamento! Puente Mayorga! Carteian Hills! Near First Pine Wood! ii. Railway, &c., about Algeciras!

†*F. arundana* Boiss. A shade form of *F. rupestris* B. & R. (*teste* Pugsley). Rocky ground; rare; 3–5. Allied to last, but flowers long, narrow, very broadly winged, sepals narrow, and fruit smaller. III. ii. Shady fissures above Algeciras, *Coss.*

F. officinalis L. Waste and cultivated ground; rare; 2–5. Leaf segments narrow, flowers small, dull coloured, upper petals with spreading, not ascending, margins, lower decidedly spathulate, fruit small, truncate or enarginate. I. Rare, *K.* III. i. Abundant about San Roque and Algeciras, *K.* By Pinar de los Bigotes!

F. parviflora Lamk. Similar places; rare; 2–5. Leaf segments narrow-linear, sepals minute, fruit rounded or subacute. I. *Boiss.* Kelaart says this species is "not quite so common" on the Rock as *F. capreolata.* It appears to be very rare, but is abundant elsewhere in the Province.

Cruciferæ.

Malcolmia littorea R. Br. Sand dunes near the sea; abundant; 1–7, or occasionally the whole year. I. Alameda (herb. Balestrino!). It is not likely to occur there now. II.! III.!

Var. *Broussonetii* Boiss. has broader, more sinuate leaves, but it runs into type, and broad leaves are not always associated with deeper sinuation. I.! II.! III.!

M. lacera DC. Similar situations; rare; 2–6. I. Maritime sands at Gibraltar, *Wk.*, *Winkl.* This might be at Catalan Bay, North Front, or Neutral Ground.

†*Matthiola sinuata* R. Br. Similar situations; rare; 5–6. II. Near the frontier line, *D.* III. i. Sand desert, *D.*

†*M. tricuspidata* R. Br. Similar situations; locally common; 3-6. I. North Front! II.! III. i. Foot of San Roque, *D.*

[*Hesperis matronalis* Lamk. Found on the Rock by Lemann, but probably a garden escape.]

Sisymbrium officinale Scop. Roadsides, fields, and waste

places; very common; 4-5. The glabrous form occurs rather frequently. I.! II.! III.!

S. Irio L. Old walls and waste places; formerly common, now rare; 2–6. I. *K.*, *D.* Racecourse!

[*S. Columnæ* Jacq. occurs as a casual on the Glacis and near the Cemetery!]

[*S. austriacum* Jacq. A casual by Reclamation Road! My specimen has long virgate racemes of very spreading pods longer than their pedicels, but usually the pods are suberect and shorter.]

Nasturtium officinale Scop. Watercourses; frequent; 2–6. Large forms are probably var. *siifolium* Steud. III.!

†*N. hispanicum* B. & R. By streams; locally common? 3–6. Flowers small, yellow, pods oblong, subinflated. III. i. Abundantly by a tributary of the Guadarranque near San Roque, *K.*

Arabis hirsuta Scop. Dry rough places; rare; 4–6. III. i. Alcadeza Crags!

Cardamine hirsuta L. Rather shady bushy ground; frequent; 1–3. I. Mediterranean Steps! Breakneck Battery! Middle Hill! III.!

†*Succowia balearica* Med. Rocky *débris*; locally frequent; 2–4. I. Foot of north, north-east and north-west precipices! Monkey's Cave! Above Mediterranean Tunnels! Spur Battery! At foot of San Roque, *D.*

[*Sinapis alba* L. is recorded by Kelaart for Gibraltar, doubtless a casual.]

[*S. arvensis* L. Waste and cultivated land; casual? 3–6. I. *K.*, *D.*]

†*Brassica lævigata* Lag. Sandy ground; rare; 3–5. Usually with a radical rosette of deeply pinnatifid leaves, with several broad dentate segments; but my gathering has several narrow elongate subentire stem leaves. Flowers rather large, racemes becoming very lax, with long-beaked pods on long pedicels, valves one-ribbed. III. ii. Lane at Palmones Playazo!

B. sabularia Brot. Sandy places, chiefly in open woods; locally common; 2–5. III. i. Both Pine Woods! Cork Woods! ii. Palmones Pinar!

†Var. *papillaris* Boiss. Perennial? many-stemmed, with spiny white setæ all over, except pods; leaves less deeply divided, beak conical, 1–2-seeded. I have failed to find this or type in its only station, and fear that alterations have exterminated it. I. Slopes over Catalan Bay, *Boiss.*, *D.*, &c.

†*B. Tournefortii* Gouan. Waste sandy ground; rare; 3–4. Like last but flowers small, purplish, veined with deeper purple, beak of pods longer, about equal valves. III. i. Sands at foot of Fort San Felipe, *D.* Fields by shore at foot of San Roque, *D.* (A dwarf form at these two stations, *Deb.*) ii. Heath near Palmones Pinar, 2–3 ft. high!

†*B. fruticulosa* Cyr. Rocky and rough places; rare; 3–6. Perennial, with rounded subcrenate leaf lobes. I? *D.* ex P. L. Fl. p. 641. Dautez does not record it from the Rock in Debeaux,

but the latter comments on its existence there in his notes. III. i. Precipices at San Roque, *D.* By San Roque Alameda!

Erucastrum incanum Koch (*Brassica adpressa* Boiss.). Roadsides and waste places; abundant; 3–6. I.! II.! III.!

Diplotaxis erucoides DC. Sandy or cultivated fields; rare; 1–6. Flowers white, claws violet. I. *D.* III. i. and ii. San Roque and Algeciras, *D.*

D. virgata DC. Uncultivated and sandy ground; rare? 11–6. Distinguished from next two by much less lobed leaves; lobes usually few and shallow, often reduced to teeth. III. i. San Roque, *Ball.* ii. Algeciras, *Clem.*

D. siifolia Kunze. Similar situations; very common? 11–6. I cannot distinguish between this species and the next—descriptions hardly differentiate them. One of the two is abundant, often in large masses. It varies almost indefinitely in size and leaf-lobing. I. Lower parts, chiefly in grassy places! II.! III.!

D. catholica DC. Similar situations; rare—at least in the Province generally; 11–6. III. i. Between Gibraltar and San Roque, *Pourr.*

Raphanus Raphanistrum L. Dry open ground; abundant; 1–5. Not an escape at Gibraltar, as Debeaux suggests; it is obviously native over the whole region. I.! II.! III.! My 1729 from railside near Almoraima is a large and handsome form.

Crambe filiformis Jacq. Stony *débris*, usually in mountains; rare; 5–8. III. i. South slopes of San Roque, *D.* ii. A single plant by railway near Algeciras!

Rapistrum rugosum All. Fields and waste places; abundant; 3–5. Closely resembles *Erucastrum incanum*, except in fruit. Var. *glabrum* Host, with glabrous fruit, occurs commonly. I.! II.! III.!

Biscutella apula L. var. *microcarpa* Boiss. Sandy or gravelly fields; frequent; 2–5. Annual, flowers rather pale yellow, locules 1½ lines in diameter, hispid. I. South and west slopes, *K.*, *D.* I found this in 1883 near Michael's Cave, but not recently! III. i. and ii.!

Var. *megacarpæa* Boiss. (*B. bætica* B. & R.). Commoner than last with us, but less so elsewhere in the Province. Locules 2–2½ lines in diameter. III. i. and ii.!

B. scutulata B. & R. Heathy ground and open woods; common, often very abundant; 2–5. Flowers small, deep yellow, fruit smooth, locules 1 line in diameter, filaments broadly winged. This and the last seldom grow together. III. i. and ii.! Very abundant in Waterfall Valley!

B. lævigata L. Heathy and rocky places in woods; locally frequent; 3–5. Perennial, leaves thin, subglabrous. III. i. Cork Wood and Alcadeza Crags!

Var. *tomentosa* Amo (*B. montana* Cav.). Rocky bushy ground; locally common; 2–5. Leaves thick, pilose. I.!

†*Iberis gibraltarica* L. Bushy rocky ground; locally common; 2–5. I.!

I. contracta Pers. Similar places and bushy sandy ground;

locally common; 6–7. Perennial, slender and straggling, with long lax branches and linear leaves. III. i. Cork Wood Crags and rough ground below!

I. pectinata Boiss. Rough bushy slopes; locally rather common; 4–6. III. i. South slopes of San Roque, *D.* Cork Wood Crags! Alcadeza Crags, a form with entire leaves, resembling *I. ciliata* All! Perez Lara remarks on its polymorphism.

[*I. umbellata* L. was collected by Reverchon in S. de Palma, doubtless as an escape.]

Teesdalea Lepidium DC. Open sandy and gravelly places; locally common; 12–2. III. i. All over Bonel's Farm to summit of Chair! Malaga Gardens! Cork Woods! ii. Heath near Palmones Pinar!

Capsella Bursa-pastoris Moench. Roadsides and waste places; common; 1–4. I.! II.! III.!

**Lepidium Draba* L. Roadsides and waste places; rare; 3–6. I. *Débris* of forts, &c., even in the town, *D.* III. About San Roque! ii. A single plant near Carnero Point!

L. latifolium DC. River banks and marshes; rare; 5. III. iii. By Palmones River!

Senebiera Coronopus Poir. Waste places, mostly near buildings; rather frequent; 4–6. I. Rosia Parade! II. *D.* III. i. Campamento and roadside beyond! San Roque! Near upper ford on Lajo! ii. M. de la Torre! Algeciras!

S. didyma Pers. Similar places; less frequent; 4–6. I. Reclamation Road! Haynes's Foundry, an erect form simulating *Lepidium ruderale* L! Sunnyside Steps, *K.* II. *K.* III. ii. El Cobre!

Lobularia maritima Desv. Rocky and bushy places; very abundant on Rock, rather local elsewhere; 10–5. An annual form, quite distinct from next, grows on slopes before Catalan Bay! A prostrate form near the Pedrera may be var. *densiflora* Lge.! I.! III. i. Andalucian racecourse! Punta Mala! Cork Woods! ii. Palmones Playazo! Carnero Point! iii. Guadacorte!

L. lybica Coss. Sandy ground; very local; 11–1. Annual, not perennial as described. I. Racecourse!

Cakile maritima Scop. Sandy seashores; rather frequent; 3–5, and occasionally the whole year. I. Glacis! Sentry Fence! Beyond Catalan Bay! II.! III. ii. and iii. Mouth of Palmones River, both sides! Sandy Bay!

[CAPPARIDEÆ.

Capparis spinosa L. An occasional escape, but looks quite native in Palmones Sands!]

CISTACEÆ.

Cistus albidus L. Bushy hill slopes and valleys; rather locally common; 2–5. I. Above Mediterranean Road! III. i. Arroyo Viejo! Alcadeza Crags! Pine Wood Plains! Cork Woods, chiefly crags and ravines!

C. crispus L. Bushy places and heaths; common; 4–6; III. i. and ii.! Reaches Carnero Point!

C. monspeliensis L. Bushy places and woods; locally common; 4–5. III. i. Alcadeza Crags and Ravine! First Pine Wood! This may be the species referred to by Kelaart (Fl. p. 161) as *Helianthemum monspeliacum*, found by him on Queen of Spain's Chair.

C. salviæfolius L. Bushy places; common; 2–5. Its pure white flowers turn quite yellow in drying. I. Over Mediterranean Road! III. i. and ii.! Reaches Carnero Point!

C. populifolius L. Bushy and rocky places on mountains; rather locally plentiful; 4–5. III. i. Summit of Queen of Spain's Chair! Alcadeza Crags! ii. Mountains!

Var. *lasiocalyx* Wk., with a very pilose calyx, is perhaps commoner than type. III. i. Queen of Spain's Chair! Almoraima, *Schott.* ii. Mountains!

C. ladaniferus L. Hilly woods; rare, though frequent beyond our limits; 3–5. III. i. First Pine Wood, two or three bushes!

C. Bourgeanus Coss. Bushy heaths and in woods; locally abundant; 5–6. Flowers white, more or less whorled, on long pedicels. Like a *Halimium*, and closely resembling *H. umbellatum*, but quite glabrous and leaves longer. III. i. Pine Wood Plains! Between Almoraima and Long Stables!

Halimium Libanotis Lge. Sandy plains, heaths and woods; locally abundant; 2–5. Low, densely covered with unspotted yellow flowers. My only gathering, from Palmones Playazo, is of a broader leaved form than type. III. i. Cork Woods! Pine Wood Plains! Alcadeza! ii. Palmones Playazo!

H. halimifolium Wk. Bushy hill slopes and woods; rather locally abundant; 5–6. Tall, leaves finely white-silky, flowers spotted or not. Varies considerably in habit and stature. II. *D.* Not there now. III. i. North-east slopes of Chair! Cork Woods! Pine Wood and Alcadeza Plains!

Var. *crispatum* Wk. Leaves smaller, undulate, epicalyx longer, filaments purple, not yellow. III. ii. S. de Palma, *B. & R.*

H. eriocephalum Wk. var. *asperrimum* Wk. (*H. lasianthum* Pers.). Bushy and heathy mountain slopes; locally common; 1–5. Flowers rather large, golden yellow, not spotted, on very short lateral branches of straggly main stems. III. i. Almoraima *Wk* ii. Mountains! M. de la Torre!

†*H. formosum* Wk. Similar places; rare; 4–5. Peduncles much longer than in last, petals usually spotted. III. ii. S. de Palma in Los Barrios district, *Winkl.*

Tuberaria vulgaris Wk. Sandy heaths and in mountains; very common; 3–5. III. i. and ii.!

T. variabilis Wk. (*Helianthemum guttatum* Mill.). Sandy and gravelly heaths and fields; very common; 2–6. III.!

Var. *plantaginea* Wk. Larger and stouter, more branched, leaves much broader, petals usually, not always, spotted. Common. III.!

†Var. *Cavanillesii* Wk. Viscid pubescent, petals often un-

spotted. III. i. Sandy grassy places at foot of San Roque, and on S. Carbonera, *D.*

†Var. *Linnæi* Wk. Petals with a very large spot, forming a dark eye. III. i. North of Alcadeza Crags, rarely!

Var. *inconspicua* P. L. Flowers very small, on longish pedicels, petals not longer than calyx. I. Maritime sands on north and west coasts, *D.* III. i. About San Roque, *B. & R.* Valley south of Long Stables! Pinar del Rey, *Porta & Rigo*!, labelled *T. bupleurifolia* Wk.

Var. *brevipes* P. L. Pedicels much shorter than calyx, petals spotted. III. i. Near Almoraima, *B. & R.*

T. macrosepala Wk. Similar situations; frequent; 4–6. Epicalyx much larger and more hirsute. Varies considerably in size of flower, petals sometimes spotted. III. i. and ii.! iii. Sands at Guadacorte!

T. echioides Wk. Similar places; rather rare; 4–6. Very hairy, racemes dense, flowers subsessile, epicalyx very large. III. i. About Gibraltar and San Roque, *B. & R.* Cork Woods and Crags! ii. Algeciras, *Schott.*

Helianthemum ledifolium Thib. Sandy and gravelly places and path sides; very local; 4–5. Coarse, erect, petals pale, very deciduous, capsule very large, trigonous, shining. III. i. Malaga Gardens! Pinar de los Bigotes to San Roque Bull-ring!

H. intermedium Thib. Dry gravelly places; very local; 2–3. Slender, annual, fruit pedicels divaricate, upcurved. The earliest species. Perez Lara makes it a var. of *H. salicifolium* with smaller petals or none, and sepals twisted after, as well as before, flowering. III. i. Path to First Pine Wood, and beyond the wood! Malaga Gardens! iii. Near Guadacorte!

H. ægyptiacum Mill. Similar places; rare; 3–4. Resembles last, but pedicels reflexed after flowering; sepals translucent, and petals pale yellow. III. i. Between Pinar de los Bigotes and Magazine Hill! Foot of San Roque, *Wk.*

†*H. glaucum* Boiss. Dry rocky slopes; locally common; 3–6 Dwarf, cæspitose, ashy green, with bright yellow petals. III. i. Cork Wood Crags!

†Var. *erectum* Wk. is taller and more virgate, with narrower more revolute leaves. III. i. With type, but rarer!

H. lavandulæfolium DC. Bushy places on hills; rather locally common; 4–6. Stems virgate, suberect from a straggly woody base, leaves narrow, strongly revolute. III. i. Cork Wood Crags! Between Malaga Gardens and Alcadeza Crags! Between San Roque and S. Lorca! South slopes of San Roque, *D.*

†*H. origanifolium* Lamk. Rocky places; very local and rather scarce; 4–6. Dwarf, intricately branched, leaves small, dark green, petals deep bright yellow. The closely allied *H. marifolium* DC. has leaves more cordate at base, and incanous, not green, beneath. I. Over Mediterranean Road!

Fumana glutinosa Boiss. Sandy and gravelly heaths and slopes; very common; 2–6. I. *Wk.* West slopes, *D.* III. i. and ii.!

Var. *juniperina* Wk. Stems not glutinous above, leaves more

acute, is much rarer. III. i. Near San Roque, *Wk.* Cork Wood Crags ! ?

F. lævipes Spach. Similar places; rare; 3–5. Almost wholly glabrous, leaves filiform. III. ii. About Algeciras, *Clem.* Perez Lara has found it near Tarifa, but does not record it elsewhere.

Frankeniaceæ.

Frankenia pulverulenta L. Sandy or muddy ground near sea; rare; 4–6. I. Roadside at Governor's Cottage! Europa Lighthouse! II. *D.*

F. hirsuta L. (*F. lævis* L.). Similar places; locally common; 5–6. I. Rocks at Windmill Hill, *K.*, *D.* II. In great abundance, *K.*, *D.* Certainly not abundant there now; I have not found it, nor on North Front. III. ii. Stream south of Algeciras! iii. By Aguacorte above Palmones!

Var. *intermedia* Boiss. has puberulous stems. I. Governor's Cottage! Lighthouse! Europa Glacis!

Droseraceæ.

Drosophyllum lusitanicum Lamk. Bushy hill and mountain slopes; frequent; 4–5. III. i. North slopes of Queen of Spain's Chair! Alcadeza Crags! ii. Mountains!

Violarieæ.

Viola odorata L. Damp grassy places among bushes; very local; 1–3. III. ii. Among *Nerium* below El Cobre!

V. arborescens L. Sandy and rocky hills; rare; 12–4. III. i. About San Roque, *Brouss.* [Near Tarifa, *Clem.*; beyond our limits.]

V. arvensis Murr. Sandy ground among *Pteris*, &c.; locally frequent; 2–4. III. i. About Almoraima and Long Stables!

Polygalaceæ.

Brachytropis microphylla Wk. Heathy places on mountains; locally common; 1–5. III. ii. Mountains!

Polygala rupestris Pourr. Rocks on mountains; rare; 1–6. Our plant is f. *angustifolia* Deb., with longer narrower leaves and more canescent branches than type. I. Mediterranean Tunnels! Near Michael's Cave! Beyond Catalan Bay!

P. monspeliaca L. Dry pastures; frequent; 3–5. III. i. Carteian Hills! Opposite Francia's Farm! Foot of Queen of Spain's Chair! Near Alcadeza! ii. About Pelayo! Carnero Hills! Hills round Algeciras!

P. bætica Ek. Heathy places on mountains; rather frequent; 2–5. III. i. Queen of Spain's Chair! Cork Woods! ii. Mountains! With reddish purple flowers on neck over Pelayo!

Resedaceæ.

†*Reseda alba* L. Roadsides and waste places; locally common; 2–6. Var. *undulata* Lge. has approximate, much undulate leaf segments, but in all I have seen they are flat or undulate, inde-

pendent of their spacing or width, which vary greatly. I. Rock and North Front! III. ii. Near Algeciras, *P. L.*

[*R. undata* L. Reported by Kelaart from the Rock; probably synonymous with *R. bætica* Gay, which is reported from several up-country stations.]

†*R. propinqua* R. Br. (*R. Gayana* Boiss. ?). Sandy ground; very rare; 5. Much more slender, with smaller more sessile flowers, and much smaller pods. II. *D.* I have searched several times in vain for it, but have seen none of the genus there.

R. lutea L. Cultivated fields and roadsides; locally common; 4–6. Debeaux only admits var. *minor* Mull., but all the examples I have seen are at least as tall, and often taller, than type—often 2 feet high. I. *K.* Kelaart doubts its nativity, but it is usually a weed of cultivation. III. i. Between Campamento and San Roque! First Venta! About Pinar de los Bigotes!

R. media Lag. Among bushes on rough ground and on mountains; common; 2–6. Confounded with *R. Phyteuma* L., but differs in sepals not accrescent after flowering, and filaments subulate, not dilated upwards. I. West slopes, *Amo*, *D.* III. i. and ii.! In profusion on mountains after a fire!

R. Luteola L. Disturbed waste ground; rather frequent; 3–6. Var. *Gussonei* Mull. (*R. Luteola* f. *robusta* Daut. & Deb.) is the only form admitted by Debeaux, taller, up to 4 ft., with long adpressed lateral branches and large flowers, but the type is more frequent. I.! II. Rare! III. i. and ii.!

Astrocarpus Clusii J. Gay var. *spathulæfolius* G. & G. Heathy places; frequent or common; 3–6. III. i.! ii. Palmones Pinar! iii. Palmones Village!

Caryophyllaceæ.

Tunica velutina Fisch. & Mey. Dry gravelly places, woods and mountains; frequent; 4–6. III. i. Queen of Spain's Chair! Alcadeza! Cork Woods! ii. By railway in several places! M. de la Torre! Mountains!

T. prolifera Scop. Similar places; less frequent; 5–6. Stems glabrous, leaf sheaths shorter. Perez Lara describes a third species, *T.* (*Kohlrauschia*) *pinetorum*, with intermediate characters, and suspects that the Queen of Spain's Chair plant, which he has not seen, may belong to it. I. Mediterranean Steps! Dockyard! III. i.! "In great abundance on the Queen of Spain's Chair and Cork Woods," *K.* Neither species is abundant, but *T. velutina* is certainly the commoner. ii. Near Cortijo Trinidad! iii. Palmones Sands!

†*Dianthus lusitanicus* Brot. (*teste* F. N. Williams). Dry heaths; rare; 6-7. Petals notched, not incised, leaves slender, green. III. i. Between Malaga Gardens and S. Lorca!

D. Broteri B. & R. var. *brachyphyllus* Wk. Dry banks and rocky places; rare; 6–7. Petals fimbriate. The var. is more cæspitose, leaves shorter, stiffer, and calyx shorter, with 8–12, not 6 scales. I. *Rev.* III. i. Lane beyond Bonel's Farm! Lower mountain region of San Roque, *D.*

†*D. Caryophyllus* L. Rocks; locally frequent; 5–7. It often has six bracts as in *D. Boissieri*, instead of four, as described. I. Upper parts from north to south, above 600 ft!

D. Boissieri Wk. Rocks; very rare; 5–8. There is much dispute as to the name of this species, but all authors regard it as distinct from last. Kelaart identified it with *D. sylvestris* Wulf. (Boiss?), which Perez Lara makes synonymous with *D. virgineus* G. & G., *D. Boissieri* Wk., and *D. longicaulis* Ten. It has half-included, non-contiguous, smaller petals than last, and slight differences in sepals. I have never seen a specimen. I. Precipices over St. George's Hall, *K.*, *D.*

†*Velezia rigida* L. Dry gravelly heaths; rare? 5–6. III. i. Path to First Pine Wood!

Eudyanthe Cœli-rosa Reichb. Grassy and bushy places; occasional; 5–6. III. i. Alcadeza Crags! Wooded slopes of San Roque, *Boiss.* ii. By the Miel and fields below El Cobre! Carnero Hills!

E. læta Reichb. Marshy places; rather common; 3–6. III.!

Melandrium microcarpum Wk. Bushy places; rather frequent; 3-6. Corolla slightly cream-coloured, often decidedly so on back; capsule teeth erect or slightly spreading, not revolute, but often scaphiform at apex so as to appear inflexed, seeds grey, laterally compressed, quite rounded on back, punctate in rows. I doubt its being more than a variety of *M. pratense* Rohl., with a larger, more globose capsule. I. Mediterranean Steps! Middle Hill! Near Signal Station! Haynes's Cave! &c. III. i. Queen of Spain's Chair! Alcadeza Crags! Cork Woods! ii. Waterfall Valley! Slopes over Pelayo! Palmones Playazo!

Silene gallica L. Sandy fields, roadsides and waste places; very common; 3–5. Varies greatly in size and colour of flowers, corolla sometimes almost obsolete, or large and conspicuous, white or rose. I.! II.! III.!

S. cerastioides L. Similar places; rare? 4–5. Very like last, but never viscid, petals deeper rose and bipartite, calyx veins anastomosing, teeth longer and narrower. I. *Colm.* i. Road to S. Lorca! ii. Algeciras, *Née.*

S. nocturna L. Roadsides and gravelly places; frequent; 3–5. Usually apetalous (var. *permixta* Jord.), then known from *S. apetala* by wingless seeds and long cylindrical calyx. I. Mediterranean Steps! Engineer Road! Commercial Mole! Europe Flats! III. i. and iii.! ii. Railside near M. de la Torre! My 1694 and 1840, common on mountains after a fire, with bright purple petals, greenish on back, and longer carpophore than usual, are probably this.

S. hirsuta Lag. Sandy and heathy places; very common; 3–6. Petals bright rose, calyx with very long spreading hairs, tube long and narrow, curved up, seeds wingless. II. *D.*, *Schott.* III.!

†*S. mogadorensis* Coss. & Ball. Sandy ground; rare; 4–5. "Aspect of *S. obtusifolia*, but glandular pubescent, with narrower leaves. Flowers purple. Calyx not contracted at mouth, teeth oval, subobtuse; anthophore more than half as long as capsule.

Calyx truncate, umbilicate, scarcely veined, constricted below, seeds strongly striate, obtusely channeled on back." III. ii. Algeciras, *Porta & Rigo*.

†*S. obtusifolia* Willd. Rocky *débris* and stony ground; locally common; 2–4. Petals not white, as described, but dingy rose or purple, always so on back, leaves broad, obtuse, thickish, seeds wingless. I. North-western slopes from Farringdon's to Rock Gun! Governor's Cottage! Dockyard! *Débris* slopes below Galleries! III. ii. Carnero Point! Probably Reverchon's "Algeciras" Station.

†*S. vespertina* Retz. Grassy banks; rare; 4–5. Petals bright rose, like those of *S. hirsuta*, but calyx less hirsute, and constricted at apex in fruit. Flowers rather crowded at end of branches, often with a flower in the fork. I. "On a small bank to the right" of the Inundation? (*K.*, Fl. p. 67). Many alterations have been made since Kelaart's day, and his station is not clear. III. i. Sandy fields near Spanish racecourse, *K.*, *D.*

S. micropetala Lge. (*S. vestita* Soy-Willm. & Godr.). Sandy ground; rare; 4–5. Petals small, bright rose, not white as described, calyx cylindrical, quite erect in fruit, not constricted at mouth, with anastomosing veins, and closely adpressed silky hairs, seeds with flat not excavate face. III. i. Near San Roque, *Schott*. Second Pine Wood! ii. Palmones Playazo! iii. Palmones Sands!

S. littorea Broth. (*S. villosa* Forsk.?). Sand-dunes; locally frequent; 3–5. Dwarf, 2–3 in. high. Flowers large, bright rose. Only recorded elsewhere from Tarifa. I. Catalan Bay! II., *K.* III. ii. Palmones Playazo! Sandy Bay!

S. colorata Poir. Dry rocky slopes and stony places; occasional; 2–5. Resembles both *S. obtusifolia* and *S. hirsuta*, but differs from both in winged seeds. From *S. obtusifolia* its bright rose flowers distinguish it, and from *S. hirsuta* its broader leaves and calyx tube, becoming campanulate in fruit. III. iii. Guadacorte!

Var. *lasiocalyx* Soy-Willm. & Godr. has a longly hirsute calyx, and is much the commoner. I. Below Mediterranean Road! II. i. Sand-dunes at foot of S. Carbonera, *K. D.* ii. Roadside towards Puente de los Pastores! Siding near M. de la Torre?

S. longicaulis Pourr. Sandy heaths and open woods; rather rare; 2–5. Not at all like *S. apetala*, as Perez Lara thinks, much taller, usually unbranched and few-flowered, petals exserted dull purple, seeds winged. III. i. Second Pine Wood! ii. Palmones Pinar and Heath!

S. apetala Willd. Roadsides, walls and waste places; locally frequent; 2–4. Apetalous, short, much branched, fruit calyx broad, campanulate. I. Willis's and Michael's Cave! III. i. Path to First Pine Wood! ii. Algeciras Station!

S. nicæensis All. Sand-dunes; very common; 1–12. I.! II.! III.!

S. rubella L. Sandy fields or grassy places; rare; 2–5. Flowers bright rose, cymes short, more or less compact, calyx

very finely adpressed puberulous, appearing glabrous, often reddish. III. i. Cornfield by the Cagancha, near San Roque!

S. portensis L. Sand-dunes; rare; 6–8. Very slender, much branched from the base, leaves very narrow-linear, flowers in dichotomous cymes, calyx elongate, not contracted at mouth in fruit, carpophore long, seeds flat on face and back. III. ii. Near Palmones River, *Rev.*

S. inaperta L. Sandy hills; rare; 5–6. Resembling last, but minutely pubescent, less branched from base, fruit calyx much shorter, carpophore shorter, seeds channelled on back. III. i. Foot of San Roque and of S. Carbonera, *D.*

S. stricta L. Dry, gravelly, or sandy places; rare; 5–6. Very viscid, leafy nearly to top, panicle branching, fruit calyx contracted at mouth, truncate at base, ribs narrowly winged, petals bright rose. Closely resembles *S. muscipula* L., which has wingless calyx ribs. III. i. Near San Roque, *Ball.* ii. Algeciras Station!

†*S. nutans* L. (*S. longicilia* Otth.). Dry hills; rare; 4–6. Perennial, flowers nodding, carpophore decidedly shorter than capsule. III. ii. Upper slopes beyond Waterfall, an unusually broad-leaved form! S. de Palma, *Rev.* Leaves of apparently the same species near summit of Frayle ridge!

†*S. mellifera* B. & R. Stony and rocky places; rare; 4–6. Near *S. italica*, but flowers greenish yellow, and calyx only 4–6 lines long, leaves broader. III. i. Alcadeza Crags!

†*S. italica* Pers. Dry banks and rocky ground; rare; 4–6. Perennial, flowers erect in a viscid panicle, carpophore as long as capsule, petals white, calyx 6–7 lines long. III. i. Rocky ravines of San Roque and open places in Cork Woods, *Boiss.*

S. mollissima Sibth. & Sm. (*S. velutina* Pourr.). Rocky fissures and precipices; rare; 4–6. Very softly tomentose, petals white, often red on back, calyx glandular-pubescent, veins anastomosing. I. North and east precipices, *Boiss.*, *Wk.*, *&c.* By Mediterranean Road and west side of Rock, *K.*

†*S. gibraltarica* Boiss. Similar situations; rare; 4–6. Differs in shorter pubescence, pale violet flowers, calyx without veins, viscid, as well as upper part of panicle. Perhaps a variety of last, confined to the Rock and North Africa. I. Inaccessible parts on east side, *Boiss.*, *Wk.*, *&c.* By Mediterranean Road, *K.* I have searched for this in vain over Catalan Bay, where much of the vegetation has been removed from the foot of the precipice in connection with the water catchments.

[*S. conica* L. Recorded by Lagasca from the Rock; probably an error.]

S. inflata Sm. Rough bushy, or cultivated ground and roadsides; rather frequent; 3–5. Debeaux only records var. *angustifolia* DC., which I have not seen. I.! III.!

†*S. commutata* Guss. Similar places; rare? 3–5. Like last, but leaves broader, often subcordate, more fleshy, pedicels longer, calyx more inflated, seeds finely granulated, not tuberculate. III. i. Near San Roque, *Wk.*

†Var. *longifolia* Wk. has all leaves attenuate at base, linear lanceolate, flowers much larger. III. i. San Roque, *Wk.*

**Saponaria officinalis* L. Sandy places and roadsides; usually near cottages; occasional; 5–7. I. Hedges and waste places in the town, *D.* III. i. By Lajo in several places! Lane towards First Venta! iii. Salt Pans! Palmones Village!

S. Vaccaria L. Cultivated clayey or sandy fields; rare; 4–5. III. iii. Between San Roque and Algeciras, *D.*

†*Sagina maritima* Don. Sandy or rocky ground near sea; rather rare, or overlooked; 3–5. Leaves quite obtuse. I. South and west coasts, *Rev.*, *D.* North Front! III. ii. Carnero Point, *P.L.*

S. apetala L. Sandy and gravelly fields; common; and probably general; 3–5. Leaves always, and sepals usually, mucronate. I.! III. ii.! Noted from II., but the plant seen may have been *S. maritima.*

†Var. *capillaris* Lge. Much more branched, elongate and slender. III. ii. Waterfall Valley! S. de Palma, *Rev.*

[*S. procumbens* L. Leaves of what might have been this seen on Glacis and elsewhere, but perhaps only prostrate examples of last.]

†*Alsine tenuifolia* Cr. var. *hybrida* Wk. Dry, gravelly, and rocky places; rather rare; 3–5. Calyx eglandular, leaves outcurved, not strict, taller and less diffusely branched than type, which is not Spanish. I. Mediterranean Steps! Green's Lodge! III. i. Alcadeza Crags! Cork Woods!

A. procumbens Fenzl. Dry rocky places; locally frequent; 3–6. I. Buena Vista to Mediterranean Steps! Engineer Road! Rosia! Above Alameda!

†*Moehringia pentandra* Gay. Damp woods and rocky watercourses; locally common; 2–5. Very near *M. trinervia* Clairv., and perhaps a variety, but sepals shorter than capsule, petals none, stamens about 5 (3–8 in mine), leaves shorter and broader. The nerves vary from three to five in both. III. ii. Waterfall Valley!

Arenaria spathulata Desf. Damp clayey spots in fields and paths; frequent; 2–5. III. i. and ii.!

A. leptoclados Guss. Dry rocky slopes; rather rare; 4–5 Kelaart's record of *A. serpyllifolia* L., of which many authors consider it a slender variety, doubtless belongs here. Perez Lara thinks all he has seen belong here. I. Near Farringdon's. South and west slopes, *K.* III. i. North slopes Alcadeza Crags!

A. emarginata Brot. Dry sandy plains; common; 2–4. A dwarf inconspicuous annual, with white or rose notched petals. III. i. and ii.!

†*A. algarbiensis* Welw. Similar places? rare; 3–4. A dwarf very slender annual, leaves very narrow, short, petals rather large, white, entire. III. ii. Near Algeciras, *Porta & Rigo.*

A. montana L. Bushy or rocky places on mountains; rare; 4–6. Flowers large, white, leaves lanceolate, glabrous. I. *K.* Unconfirmed, but quite a likely habitat. III. ii. Summit of El Frayle!

Moenchia octandra Gay. Damp grassy and partially shady places; common; 2–4. III. i and ii.! Reaches top of Queen of Spain's Chair!

Cerastium glomeratum Thuill. (*C. viscosum* L.). Roadsides, waste ground, &c., very common; 2–5. Varies much in habit, often apetalous. I.! II.! III.!

†*C. brachypetalum* Desp. Dry gravelly places; rare? 3. More slender, pedicels much longer, usually deflexed in fruit, claws of petals glabrous, or ciliate only at base, capsule one-third longer than calyx. I. Mediterranean Steps! III. i. Path to First Pine Wood! Both *teste* F. N. Williams.

C. Boissieri Gren. Rocks and *débris* on mountains; the type, with densely white-tomentose leaves, rare; 4–5. I. Near Green's Lodge!

†Var. *gibraltaricum* Gren., leaves green, but viscid, is common. I.!

Stellaria media Vill. In all situations; very common; 12–5. I.! II.! III.!

S. neglecta Weihe var. *umbrosa* Opiz. Shady places; probably frequent; 2–5. Elongate, flowers rather large, sepals and pedicels glabrous, rarely slightly pubescent, fruit acutely tuberculate, stamens normally 10, but often 3–5. The type has pubescent pedicels and sepals, and may occur. III. i. Malaga Gardens! iii. Salt Pans! Both *teste* E. S. Marshall.

S. uliginosa Murr. Swampy places; rare; 3–5. III. i. Near summit of Queen of Spain's Chair!

Spergula arvensis L. Sandy and gravelly places; the type rare; 1–5. III. ii. Algeciras, *Wk.*

†Var. *glutinosa* Lge. is canescent and glandular; very common. III.!

Spergularia rubra Pers. var. *longipes* Lge. Sandy fields; common; 1–6. Suberect, straggling, little or not glandular, internodes rather long, stipules narrow, inflorescence lax, leafy, flowers deep rose, seeds not winged. III.!

†Var. *pinguis* Fenzl. (*Lepigonum neglectum* Kind.). Stouter, leaves thicker, cymes glandular, flowers and seeds larger. From the description and synonymy this is surely a var. of *S. marina* Wk. I. Sands at Gibraltar, *K.* III. ii. Cornfields at Algeciras, *Rev.*

†*S. purpurea* Pers. (*S. diandra* Heldr.). Sandy ground; rare? 3–5. Erect, slender, little branched, glabrous except cymes, leaves setaceous, short, flowers large, deep rose, stamens 2–3. II. *D.* III. ii. Marsh at Palmones Playazo!? This form is suberect, rather strict, leaves and internodes long, pedicels long, glandular, sepals very acute, glabrous, petals bright rose, stamens 2–5. Mr. G. C. Druce thinks it may belong here.

†*S. atheniensis* Asch. (*S. campestris* Wk.?). Sandy ground; locally common; 4–5. Prostrate, densely branched, slender and wholly very viscid, leaves very slender, cymes leafless, flowers

small, deep rose. III. ii. By Palmones Railway Bridge! iii. Los Barrios aviation ground!

S. marina Wk. Roadsides, often far from the sea; very common; 3–5. Prostrate, flowers rather small, dull rosy or whitish, in a leafy glandular cyme, some seeds winged. I.! III.!

S. media Pers. (*Arenaria marginata* Fenzl). Salt marshes; occasional; 3–6. Stout, often suberect, rather like a very large form of last, capsules much larger, pedicels longer, seeds all broadly winged. II. *D.* III. i. Mouth of Guadarranque! ii. Palmones Playazo!

†Var. *angustata* Clav. (sub *S. marginata*) has seeds very narrowly winged. III. iii. Guadacorte Marsh!

S. rupestris Lebel. Rocks; rare; 4–6. Perennial, prostrate and densely matted, internodes short, stipules large and long, flowers rather pale rose. I. By Buffadero Gate!

S. fimbriata Boiss. Sandy ground; rare? 2–3. Its description hardly differentiates it from last. I. or II. Sea sand at Gibraltar, *Salzm.* III. ii. Algeciras, *Rev.*

Linaceæ.

†*Linum gallicum* L. Rough bushy slopes; rather rare; 4–6. I. *Lagasca.* III. i. Queen of Spain's Chair!

L. setaceum Brot. Similar places; frequent; 5–6. I. West slopes, *Boiss.*, *D.* III. i. Queen of Spain's Chair! Path to First Pine Wood! Alcadeza Crags! ii. Hills near El Cobre! Carnero Hills!

L. strictum L. Dry gravelly places and old walls; common; 4-5. I.! II.! III.!

Var. *spicatum* Pers. (var. *axillare* G. & G.). Flowers axillary, in a narrow raceme. Much rarer. I. *Pourr.* III. i. Slopes of San Roque, *Boiss.* By Lajo above Almendral.

L. tenue Desf. Dry fields and banks; very common; 4–12. I. *K.* III.!

†*L. maritimum* L. Maritime rocks; rare; 6–7. Much like last, leaves broader, flowers larger, sepals obovate acute, not lanceolate acuminate. I. Grassy places and rocks at South Point, *Pourr.*, *D.* Kelaart indicates slopes over Engineer Road, below Michael's Cave, as the station for this.

L. angustifolium Huds. Sandy grassy places; abundant; 1–5. I. Cumberland Flank! Rock Gun! Signal Station! III.!

†*L. decumbens* Desf. Grassy places; rare; 4–5. III. i. South slopes of San Roque, *D.*

[*L. usitatissimum* L. Kelaart found this in an uncultivated part of the Rock, but I suspect it was a casual. I have seen it as such in the Dockyard.]

Radiola linoides Gmel. Watercourses and damp banks; locally frequent; 4–6. III. i. Cork Woods above San Roque, *Boiss.* Duke of Kent's Farm, *K.* Queen of Spain's Chair! ii. Waterfall Valley up to 1000 ft.! ii. or iii. Sea sand near Palmones River, *Rev.*

Malvaceæ.

Malva hispanica L. Dry sandy and stony places; very common; 4–7. I.! III.!

M. sylvestris L. Waste places and roadsides; rather frequent on Rock, much less so in Spain; 3–6. Epicalyx narrow, quite free. I.! III. i. Cachon! Almoraima Station!

M. nicæensis All. Similar places; common; 3–6. Flowers very variable in size. Known from *M. sylvestris* by broader epicalyx and smaller paler rose flowers, and from *M. parviflora* by more deeply lobed leaves, larger flowers, and calyx half covering fruit. Its free epicalyx distinguishes it from *Lavatera cretica*. I.! III.!

[*M. rotundifolia* L. is recorded for Gibraltar by Kelaart and Dautez, and is common according to Debeaux, but I have never seen it. Perez Lara says it is subalpine in S. Spain, and doubts many of the records. Probably *M. parviflora* has been mistaken for it.]

M. parviflora L. Waste ground; common, at least on Rock; 3–6. Carpels glabrous, with flat rugose back, and very acute edges, corolla very small, hardly longer than calyx. I.! II.! III., I believe frequent, but only noted from Punta Mala!

†*Lavatera arborea* L. Rough ground near sea; rare; more frequent formerly? 3–6. I. Rocks and grassy places, also near Signal Station, *K.*, *D.* A single plant at Monkey's Cave!

L. cretica L. Rough and waste places by roadsides and buildings; very common; 4–6. Epicalyx broad, connate at base. I.! II.! III.!

L. Olbia L. Woods and bushy places; rare; 5–6. Shrub, flowers clustered, axillary, leaves with a long terminal lobe. III. Near Gibraltar, *Lagasca*.

Var. *hispida* G. & G. is more hirsute, especially peduncles and calyx, leaves green above, not canescent both sides. III. i. Near Almoraima, *Laguna*. ii. By Lobo in Carnero Hills!

[*L. maritima* Gouan is recorded as abundant on the Rock by Kelaart and Dautez. It does not grow in the neighbourhood. I cannot suggest what species can have been taken for it.]

L. triloba L. Bushy ground; rare; 5–6. A tall shrub, flowers clustered, leaves cordate, orbicular, obsoletely 3-lobed. Winkler named it *L. micans* L., but Perez Lara thinks it belongs here. III. ii. Algeciras, *Winkl.*

L. trimestris L. Sandy fields; very common; 4–6. Erect or prostrate, flowers sometimes white. III.!

Althæa officinalis L. Fresh or salt marshes; locally frequent; 6–7. III. iii. Guadacorte Marshes! Both sides of Salt Pans!

[Aurantiaceæ.]

[None of the order mentioned by Kelaart is native.]

Hypericineæ.

[*Hypericum hircinum* L. is recorded by Kelaart as an introduced species in Gibraltar, *Lem*.!]

H. perfoliatum L. (*H. ciliatum* Lamk.). Bushy places and banks; occasional; 5–6. III. i. Hills over San Roque Station! Cork Woods! ii.! iii. Salt Pans!

H. perforatum L. var. *angustifolium* Gaud. Dry bushy places; common; 5–7. The type does not occur in the province. I. Above Bruce's Farm! III.!

H. undulatum Schousb. var. *bæticum* Lge. Marshy places; locally frequent; 7–8. Not seen in flower; the foliage strongly recalls *H. tetrapterum* Fr. III. i. By Lajo below First Pine Wood! ii. Mountains! iii. Guadacorte Marshes!

H. tomentosum L. Dry banks and fields; common; 6–7. I do not observe much variation in our species; the two varieties cited differ but slightly from type. III. i. and ii.!

Var. *pubescens* P. L. More erect and woolly-villous, not canescent, flowers larger, sepals narrower and more longly acuminate. III. i. Near San Roque, *Boiss.*

Var. *lusitanicum* P. L. Leaves much smaller, hispid, sepals linear-lanceolate, mucronate. III. ii. Algeciras, *Rev.*

†*H. crispum* L. Rough fields; rare; 6–7. III. i. Near First River Ferry! Carteian Hills near Puente Mayorga!

H. humifusum L. Damp grassy fields and watercourses; occasional; 5–7. According to Willkomm our form is var. *australe* Wk., stouter than type, with glandular-dentate sepals, but all I have seen appear to be type. III. i. Queen of Spain's Chair! ii. Mountains!

[Meliaceæ.]

[*Melia Azedarach* L. is only planted.]

Ampelideæ.

**Vitis vinifera* L. Bushy places, hedges, and by watercourses; frequently quite naturalised; 5–6. I only give stations where it is established. III. i. Plentiful in Cork Wood Sotos! By Lajo below First Pine Wood! First Venta, &c.! ii. Waterfall Valley! Carnero Hills! iii. Guadacorte!

Geraniaceæ.

Geranium dissectum L. Roadsides, hedge-banks, and grassy places; rather frequent: 2-5. I.! II.! III.!

G. molle L. Similar places; common; 2–5. I.! II.! III.!

†*G. columbinum* L. Woods and shady places; occasional; 4–5. I. Near Signal Station! III. i. About Almoraima and Long Stables! ii. Waterfall Valley, from El Cobre to top; Mountains over Pelayo! M. de la Torre! Carnero Hills!

G. rotundifolium L. Roadsides and waste places; frequent, especially on the Rock; 2–5. I.! III. i. Cachon! Puente Mayorga! About San Roque! First Pine Wood! Malaga Gardens! Almoraima! ii. About Algeciras! iii. Near Guadacorte!

G. Robertianum L. var. *parviflorum* Viv. Shady and bushy places; very common; 3–5. Differs from type, which is found at Tarifa, chiefly in smaller flowers. I.! III.!

Erodium cicutarium L'Hérit. Sandy and gravelly fields and heaths; very common; 12–5. I cannot satisfactorily identify all the forms of this aggregate, which, as such, occurs everywhere. I.! II.! III.!

E. primulaceum Lge. Similar places; very common; 12–5. Our earliest and commonest species, fairly distinct, with several large bright pink flowers, often colouring considerable tracts of ground. III.!

E. Jacquinianum Fisch. & Mey. Similar places; 3–6. Densely pubescent and glandular, leaves shortly densely villous, tripinnatisect, segments small, obtuse, peduncles 2–4-flowered, petals subequal, about as long as calyx, not spotted, carpels without a fold, which the last two have. I. *D.* III. i. Sandy shores by Fort San Felipe, *D.*

Var. *bipinnatum* Parl. Subglabrous, leaves less deeply divided, segments narrower, petals unequal. I. *Brouss.*

E. Salzmanni Del. Similar places; 3–6. Stout, stems dark purple, leaves bipinnatisect, segments narrow, acute, peduncles 6–10-flowered, stout, densely glandular, petals equal, scarcely longer than calyx, not spotted, carpels with a long beak, fold small or none. I. Near Old Mole, *D.* II. *D.* III. i. Bonel's Farm!? Andalucian racecourse!? Both stout forms with considerably divided leaves, and very long carpel beaks.

E. moschatum L'Hérit. Grassy and waste places; abundant; 1–5. I.! III. i. and ii.! Doubtless occurs everywhere.

E. malacoides Willd. Roadsides, banks and bushy places; very common; 2–6. Varies considerably in leaf lobing, and somewhat in colour of flowers. I.! II.! III. i.! Less frequent beyond San Roque. ii.! Rather rare, not seen in mountains.

Var. *subtrilobum* Lge. Leaves tri- or pinnati-lobed, terminal lobe largest, occurs frequently with type. I.! II.! III. i.!

E. laciniatum Willd. Similar places; rare; 4–6. Intermediate between last and next, nearer the latter, but more slender, sepals much shorter, 2–2½ lines instead of 5–6, beak shorter, 1½–2 in., and more slender, carpels without a ridge. I. *K.* Europa Point!? rather near last.

Var. *involucratum* Wk. is stouter, with larger bracts. II. *Wk.*! Willkomm's specimen looks very like *E. Botrys*, but differs in calyx, carpel and beak, and its lower leaves are more entire.

E. Botrys Bertol. Sandy and gravelly places; very common; 3–5. Stems long, straggling, flowers large; dark reddish, often striped deep red, carpels with 2–3 deep furrows, beak 3–4 in. long. [I. *Wk.*] Willkomm's No. 556 labelled "at Gibraltar and between Chiclana and Conil" is certainly *E. laciniatum*. III. i. and ii.!

Oxalideæ.

Oxalis corniculata L. Dry banks, path-sides, and by streams; rather frequent; 3–6. I. Below Devil's Gap! Buena Vista!

Below Lunatic Asylum! III. i. Cork Woods! Lajo above San Roque. Arroyo Viejo! Queen of Spain's Chair! ii. Mountains! Algeciras Station and by Miel beyond it! Guadalmeci!

**O. cernua* Thunb. Bushy banks, roadsides, and watercourses; very abundant; 12–4. This species has increased enormously in recent years. I.! III.!

ZYGOPHYLLACEÆ.

Tribulus terrestris L. Sandy ground; local; 5–7. I. North Front! II.! Not "in great abundance," as Kelaart says. III. iii. Palmones, *Rev.*

RUTACEÆ.

Ruta montana Vill. Dry bushy hills; locally rather frequent; 6–7. Leaf segments narrow, flowers bright yellow. III. i. Carteian Hills near San Roque! Towards First Pine Wood! Pinar de los Bigotes! Near Alcadeza Crags!

R. chalepensis L. Dry bushy hills; locally common; 2–6. I.! A form at Levant closely approaches next! III. i. Queen of Spain's Chair! Cork Woods and elsewhere! ii. Thinly scattered on hills and mountains!

R. bracteosa DC. Similar places; common; 2–6. Differs in much broader bracts, and shorter petal fimbriæ. I.? *K.*, who does not record *R. chalepensis*, which he may have mistaken for it. III. i. Carteian Hills! Path to First Pine Wood! Magazine Hill! ii. Carnero Hills!

CORIARIÆ.

Coriaria myrtifolia L. Thickets in marshes and by streams; locally common; 3–6. III. i. Arroyo Viejo and Lajo in many places! Railside beyond Almoraima! iii. Guadacorte Marshes!

RHAMNACEÆ.

Rhamnus Alaternus L. Dry bushy slopes and woods; rather frequent; 12–3. I.! A narrow-leaved form near Signal Station may be the form near *R. integrifolia* mentioned by Kelaart! III. i. Queen of Spain's Chair! Cork Woods! ii. Mountains to highest ridge! Carnero Hills!

R. oleoides L. Rocky bushy places; frequent; 3–5. Leaves oval or elliptical, often small. I.! III. i. San Roque, *Wk.* Queen of Spain's Chair! Cork Woods! ii. S. de Palma, *Wk.* iii. Palmones village, *Laguna.*

Var. *angustifolia* Lge. has linear lanceolate leaves, like those of next, but more rounded on sides. I. Near Windmill Hill Road, *Wk.*, &c. III. i. S. Carbonera, *Wk.*

R. lycioides L.? Similar places; rare; 4–6. Leaves narrow linear, or strap-shaped. Perez Lara thinks the records for the province refer to the last var. I. Communicated, *K.* III. i. and ii. Precipices at San Roque and S. de Palma, *K.*

R. Frangula L. Wooded valleys; locally frequent; 4–6. III. ii. Waterfall Valley!

Var. *longifolia* Rouy is a larger bush or small tree, leaves up to 5 in. long by 3½ in. wide, fruit larger, more obovate, seeds black, not yellow. Grows with type, into which it runs. III. ii. !

Ilicineæ.

Ilex Aquifolium L. Mountain woods; locally frequent; 4–5. III. ii. From Waterfall to highest ridge, very small bushes, with less spiny leaves than usual, not seen in flower!

Var. *balearica* Wk. (*I. Perado* Ait.). Leaves much larger, usually quite entire. III. ii. S. de Palma, *Rev.*

Terebinthaceæ.

Pistacia Terebinthus L. Woods and rocky slopes; occasional; 4–5. I.! III. i. South slopes of San Roque, *D.*

P. Lentiscus L. Similar places; very common on Rock and in III. i. I.! III. i.! ii. Palmones Playazo! Occasional in mountains! iii. Guadacorte! Palmones Sands!

[*Schinus molle* L. is only planted.]

Leguminiferæ.

Anagyris fœtida L. Rough bushy hills; rather frequent; 12–3. I. Old Man's Garden! Above Willis's! Below Signal Station! Alameda Gardens! III. i. San Roque, *Wk.* Almoraima Station! ii. Hills north and west of Algeciras! Carnero Hills! iii. Near Los Barrios Station!

Retama monosperma Boiss. Sandy ground; rare; 12–2. [I. Planted.] III. i. Linea! Probably Dautez's S. Carbonera Station.

Spartium junceum L. Rough bushy places; local; 4–6. I. Engineer Road! Jews' Cemetery to Gymnasium! III. i. San Roque, *D.* ii. Very common at Algeciras, *D.* I have never seen it there.

Sarothamnus bæticus Webb. Woods and bushy places; locally frequent; 1–4. Leaves large, trifoliolate. I. *Lem.*! *Rambur*! Whole side of Rock below Michael's Cave covered with it, *K.* It is not so now. III. i. Slopes of San Roque, *Boiss. & Reut.*! Cork Woods! ii. Mountains! Carnero Hills!

S. Welwitschii B. & R. Woods; locally frequent; 4–6. Like *S. scoparius*, but pod densely hairy, leaves few or none. III. ii. Waterfall Valley!

S. grandiflorus Webb? Bushy places; rare or error? 4–6. Hardly distinguishable from last, and recorded by no other collector. I. *Rambur.*

Cytisus tribracteolatus Webb. Wooded slopes; locally frequent; 1–3. III. ii. Waterfall Valley and other valleys north of it!

C. candicans DC. Woods; type rare? 1–5. Fruit straight, rufescent-hirsute. I. *Wk.*, *K.* Upper Alameda, *Frere.*

Var. *Kunzeanus* P. L. differs in several minor characters, fruit curved, white-woolly, but apparently becomes rufescent in herbaria, so that the best distinction is lost. All I have seen has pod hairs

quite white. It is very abundant. III. i. Cork Woods! ii. Mountains! Carnero Hills! Palmones Playazo! iii. Guadacorte! Palmones, *Laguna*.

C. linifolius Lamk. Bushy slopes and woods; locally common; 3–6. I.! III. i. Cork Woods! ii. Mountains! Carnero Point!

C. triflorus L'Hérit. Woods; locally frequent; 1–4. Flowers pendulous, rather pale greenish yellow, on long virgate branches. I. *Clus.*, *Tournef.* Not there now, I think. III. i. Cork Woods! ii. Mountains! Carnero Point!

Calycotome villosa Link. ("*Spartium villosum* L.," Kel.). Dry hills and bushy slopes; abundant; 12–5. I.! III.!

Genista scorpioides Spach. Rough bushy places; rare? 3–5. Very near next, but bracts at base of pedicels ovate, not subulate, spines stouter and longer. III. ii. S. de Palma, *Rev.*

G. triacanthos Brot. Similar places; locally frequent; 3–8. A rigid dark green bush, flowers usually in short subtruncate racemes. III. i. Queen of Spain's Chair! Cork Woods! ii. Palmones Pinar! Mountains!

Var. *galioides* Spach has stouter spines, longer leaves (3–4 lines), and denser racemes. III. ii. Hills above Algeciras, *Ball.* S. de Luna, *Laguna*.

†*G. Winkleri* Lge. Bushy hills; rare; 3–5. Like next, but leaves mostly trifoliolate, not simple, and bracts 3–4 times as long as, instead of little longer than pedicels. III. i. San Roque, *Winkl.*

G. gibraltarica DC. Similar places; locally common; 4–7. Flowers usually in long tapering racemes. [I. Included by Kelaart in error (see *K.* Fl. p. 93).] III. i. Queen of Spain's Chair! Cork Wood Crags! Between Almoraima and Long Stables! ii. Mountains!

†*G. Scorpius* DC.? Rocky hills and ravines; rare; 2–7. A stout-spined shrub with the aspect of a *Calycotome*. Pods much longer than last. Can Laguna have mistaken *C. villosa* for it? I. West slopes, *Laguna*.

†*G. Hænseleri* Boiss. Bushy hills; rare; 5. Very distinct, with a look of *Spartium junceum*, but flowers smaller. I. *K.* III. i. South slopes of San Roque, *D.*

Pterospartum lasianthum Wk. Heaths and rocky places on mountains; rare? 12–6. Differs little from next, chiefly in more woolly-tomentose, not silvery-silky calyx. Willkomm thinks they should perhaps be united. III. i. S. Carbonera, *D.* Almoraima, *P. L.* ii. Mountains, *Webb*, &c. S. de Luna, *Laguna*. S. de Saladillo, *P. L.*

P. tridentatum Wk. Similar places; locally common; 12–6. III. i. Queen of Spain's Chair! Cork Woods! Pine Wood Plains! Alcadeza Crags! ii. Mountains! M. de la Torre!

Ulex. §*Stauracanthus* has calyx as long as keel, lips shortly united at base, upper divided to middle. §*Nepa* has calyx about half as long as keel, lips similarly united, upper quite shortly bidentate. §*Eu-ulex* has calyx lips quite free, as long as keel. This section has the habit of *U. europæus*.

U. aphyllus Link. (§*Stauracanthus*). Woods and heaths; frequent; 2–4. III. i. Cork Woods! ii. Heath near Palmones Pinar! S. de Palma, *Clem.*

U. spartioides Wk. (§*Stauracanthus*). Similar places; rare? 3–4. I cannot distinguish this from last. III. i. Pine woods on south slopes of San Roque, *D.* There are no pine woods there now. ii. S. de Palma, *Clem.*, *Webb*, *Wk.*, &c.

U. Boivini Webb (§*Nepa*). Similar places; frequent or common; 5–11. Teeth of upper calyx lip deltoid. III. i. Queen of Spain's Chair! Almoraima, *Laguna*! ii. Frequent in mountains!

Var. *megalorites* Ball. Calyx teeth elongate, sometimes one-third as long as lip. III. i. Near San Roque, *Ball.* S. Carbonera, *D.* ii. S. de Palma, *Rev.*

†*U. luridus* Wk. (§*Nepa*). Very like last var., from which Webb's description hardly differentiates it. III. ii. Near Algeciras, *Porta & Rigo.*

U. scaber Kunze (§*Eu-ulex*). Bushy places; rare? 12–4. Spines slender, rather pliable, flowers rather small. Abundant elsewhere in the province. III. ii. Waterfall Valley!

†Var. *glabrescens* Webb has calyx hardly puberulous, with broader teeth. III. ii. S. de Palma, *Wk.*, *Rev.*

†*U. brachyacanthus* Boiss. (§*Eu-ulex*). I know nothing of this beyond Boissier's description. III. ii. Near Algeciras, *Porta & Rigo.*

U. australis Clem. (§*Eu-ulex*). (*U. parviflorus* Pourr.). Similar places; common; 2–4. III. i. Queen of Spain's Chair! Carteian Hills! ii. Mountains!

[*U. bæticus* Boiss. (§*Eu-ulex*). Kelaart says this covers many acres near Campamento. No *Ulex* is common there now, the very similar *U. australis* occurs sparingly.]

Adenocarpus grandiflorus Boiss. Wooded slopes; locally frequent; 4–6. III. i. S. Carbonera, *D.* Cork Woods! Alcadeza Crags! ii. Mountains!

[*Lupinus albus* L. is an occasional escape at Algeciras.]

L. hirsutus L. Sandy ground; occasional; 4–5. II. *K.*, *D.* III. i. By Campo Common! Below S. Carbonera, *D.* Almoraima! ii. Woods near El Cobre!

L. angustifolius L. Sandy ground; frequent, at least locally; 3–5. III. i. Spanish Racecourse, *Wk.* Cork Woods! ii. Palmones Pinar and Playazo! Behind Sandy Bay! M. de la Torre! iii. Palmones Sands!

L. luteus L. Similar places; rather frequent; 4–5. III. i. San Roque Station! Lajo Valley, below San Roque! Near Almoraima! Foot of S. Carbonera, *K.*, *D.* ii. Palmones Pinar! Cachon Farm! iii. Near Salt Pans!

Ononis campestris Koch & Ziz. Rough gravelly or clayey places; rare? 6–8. Stem hairy in lines, leaves narrow. I. *Talbot.*

†*O. repens* L. var. *horrida* Lge. Similar places; occasional; 6–8. Stem hairy all round, spiny. III. i. Carteian Hills! Near Francia's Farm! Path to First Pine Wood! Malaga Gardens! ii. Carnero Hills!

O. pinnata Brot. Sandy ground; locally frequent; 6–7. III. i. Cork Woods!? leaves only. ii. Palmones Playazo! (Probably Schott's "near Algeciras"). iii. Palmones Sands!

O. Picardi Boiss. Loose sand; locally abundant; 4–7. Annual, slender, diffuse, flowers rosy, tip of keel bright yellow. II. *D.* III. i. Pine Wood Plains! Alcadeza! Foot of S. Carbonera, *D.* ii. S. de Palma, *Rev.* iii. Palmones Sands! Guadacorte!

O. Cossoniana B. & R. Light sandy soil; occasional; 4–6. Much stouter and more erect than last, more leafy and with larger flowers, 5–6 lines long. I. Sentry Fence on North Front! II. III. i. Andalucian racecourse! ii. Behind Sandy Bay!

†Var. *rotundifolia* Wk. has larger rounder leaflets. I. *Rev.* A weed in Alameda Gardens! Dockyard! III. i. Near San Roque, *Rev.*

O. diffusa Ten. Dry sandy ground; occasional? 5–6. Differs from last in smaller size and foliaceous floral bracts, but not easily separable. I. Governor's Cottage (*K.*, as *O. serrata* Forsk., probably this but not synonymous, see Deb. Fl. p. 59). II. Sea sands on Neutral Ground near Catalan Bay, *Boiss.*, *K.*, *D.* III. i. Between Gibraltar and San Roque, *Salzm.* ii. About Algeciras, *Rev.*

O. mitissima L. Damp grassy banks and stream beds; frequent; 5–6. Annual, much branched, suberect, flowers very small, close set, rosy, bracts broad, white, with strong green nerves at base. I. East side, *K.* Signal Station Road! II. *K.* III. i. S. Carbonera, *D.* Ditches at Campamento! ii. By Railway! Carnero Hills!

O. filicaulis Salzm. Dry gravelly hills; frequent; 5–6. Much like *O. Picardi*, but grows in different soil, much less glandular and more greyish-hirsute, racemes more elongate in flower, standard brighter rose, wings and keel white, no yellow tip, and broader calyx segments, not with long subulate points. III. i. Bonel's Farm! Queen of Spain's Chair! Alcadeza Crags! ii. Carnero Hills!

O. Salzmanniana B. & R. Grassy places and ditches; rather frequent; 5–6. A stout suberect annual, spikes long, dense, thick, upper leaves trifoliolate, terminal leaflet very large, and bracts trifoliolate. III. i. By the Cachon! Railside beyond Almoraima! By Lajo below First Pine Wood! Road between Campamento and San Roque! By the Lobo! iii. By the Aguacorte!

O. alopecuroides L. Similar places; rare; 5–6. Resembles last, and perhaps a variety. Larger, leaves and bracts all unifoliolate, stipules larger and spike comose. III. i. About San Roque, *Brouss.*

O. Tournefortii Coss.? Sea sands; rare or error? 4–5. Near next, but much larger and stouter; leaves trifoliolate, corolla as long as calyx. A conspicuous plant, not recorded by other botanists. II. *D.*

O. variegata L. Sea sands; locally common; 4–5. A small annual, half-buried in sand, flowers bright yellow, twice as long as calyx, and unifoliolate leaves. I. By Sentry Fence! II.! III. i. Linea! ii. Sandy Bay! iii. Palmones Sands!

†Var. *erioclada* DC. I. Sands about Gibraltar, *Durand.*

O. reclinata L. var. *minor* Moris. Sandy and gravelly places; rare; 4–5. Flowers rose, soon pendulous, on long peduncles. The var. has shorter corolla and pods as long as calyx. The leaves in all I have collected are broadly oval or suborbicular. I. Signal Station! Princess Amelia's Battery! Above Mediterranean Tunnels! II. *K.*, *D.*

O. pendula Desf. Grassy or rocky places; occasional; 3–5. Habit of last, but flowers much larger, with yellowish, not rosy or whitish, wings. I. Buffadero Gate to Monkey's Cave! III. ii. Near Upper Aqueduct! Towards Saladillo! Carnero Hills! Sandy Bay!

O. pubescens L. Dry stony or sandy soil, especially dry watercourses; frequent; 4–6. Flowers large, yellow, peduncles muticous. I. Above Alameda Parade! Above Willis's! About Michael's Cave, *K. D.*, *Rev.*

O. viscosa L. Similar places; frequent; 4–6. Like last, but taller and much laxer, stems often red, peduncles longer and awned. I. Michael's Cave! Spur Battery! Levant! Above Engineer Road! III. i. and ii.!

Var. *fœtida* Deb. has narrower leaves, larger flowers and longer pods, about twice as long as calyx. III. i. Alcadeza Crags!? By Cagancha below San Roque!? Both these are perhaps as near type as var. ii. Algeciras, *Rev.*, *Winkl.*

†*O. crotalarioides* Coss. Similar places; rare; 5–6. Like last, but all leaves unifoliolate and pods much inflated, much longer than calyx. III. ii. Foot of S. de Palma at Algeciras, *Winkl.*

†Var. *rubricaulis* Wk. Elongate, with purple virgate branches and smaller leaves. III. ii. Near Algeciras, *Hegelm.*

†*O. breviflora* DC. Rocky grassy slopes; rare; 5–6. Like *O. viscosa*, and often regarded as a variety, but corolla shorter than calyx, and other differences. III. i. South slopes of San Roque, *D.*

O. ramosissima Desf. var. *gracilis* G. & G. (*O. gibraltarica* Boiss.). This species and the next vary indefinitely, and it is difficult to fix on any characters by which to separate them. I have regarded this as a dark green shrublet with very short glandular pubescence, and narrow elongate leaves. All other points seem unstable. The var. differs in its more slender virgate habit, with smaller leaves and peduncles with longer awns. I. Catalan Bay! Casual plants at Haynes's Cave and in Dockyard! III. i. Linea! Near Rocadillo! iii. Palmones Sands!

O. Natrix L. var. *media* Boiss. Dry hills and sandy ground; occasional; 4–8. As I understand it, a pale grey-green shrublet, with very long viscid pubescence and broadish leaflets, racemes more compact, the whole plant with the aspect of a large *O. pubescens*. It does not appear to be confined to sand dunes. The var. has smaller leaflets, often folded, and peduncles longer than floral leaves. These characters bring it very near *O. ramosissima*. I. *Boiss.*? ex Deb. Fl. p. 63. Boissier does not record it from the Rock in Voy. Bot. *K.*, *D.* III. i. Linea, *K.*, Fl. p. 178, not Neutral Ground, as cited by Debeaux.

†Var. *inæquifolia* Mut. Some, often very few, leaves pinnate, the alternate pairs of pinnæ small and close to the leaflets above them. III. i. Cork Wood Crags! Path to First Pine Wood! Malaga Gardens!

Medicago lupulina L. Rather damp grassy or shady places; rather frequent; 4–5. Spikes longly peduncled, of twelve or more very small flowers and small smooth fruits. II.! III. i. About Almoraima and Long Stables! By Lajo above Almendral! ii. Near railway about San Bernabe! iii. Gardens at Salt Pans!

[*M. sativa* L. as a cultivation escape has been found on the Rock and Neutral Ground.]

M. marina L. Sand dunes; rather frequent; 3–6. Densely white-tomentose. I. Beyond Catalan Bay! North Front! II! III. i. Near Pedrera! ii. Palmones Playazo! Sandy Bay! Towards Frayle Point! iii. Palmones Sands!

M. orbicularis All. Grassy places; occasional; 4–5. Fruit discoid, $\frac{3}{4}$ in. in diameter over thin spineless wing. I. Below Rock Gun! Grassy ravines, *K.*, *D.* III. i. About Long Stables and Almoraima! Near Malaga Gardens! Near mouth of Guadarranque, *K.*, *D.* ii. Algeciras, *Winkl.* iii. Hills near Los Barrios Station!

M. intertexta All. Grassy places; rather rare; 4–5. Large, hirsute, fruit very large, globose, closely embraced by long intertwining glabrous spines. III. ii. Near Algeciras, *Winkl.*, *Fritze.* Below railway near San Bernabe! iii. Hills near Los Barrios Station! Salt Pans near Palmones Village.

M. ciliaris Willd. Dry hills; rare; 4–5. Near last, but fruit grey-green from hispidity of spines, which are much shorter. III. i. At Carteia!

†*M. obscura* Retz. var. *tornata* f. *inermis* Urb. Waste sandy or grassy places; occasional; 3–6. Facial veins running into a lateral nerve, not a marginal one. I have only found the form cited which has an unarmed pod of four or more turns with thin edges, easily mistaken for unarmed forms of *M. littoralis.* I. Reclamation Road! Dockyard! Behind Assembly Rooms!

M. truncatula Gaertn. var. *longiaculeata* Urb. (*M. tribuloides* Desr.). Similar places; locally frequent; 3–6. Facial veins as last, but fruit subcylindrical, pubescent, spines stout from a very swollen base, not grooved nor hooked, usually parallel to axis and intercrossing. The var. cited is, according to Willkomm, the only one known in Spain. †*M. uncinata* Willd., found by Kelaart at Gibraltar, is a form with uncinate spines. I. From Buena Vista to Governor's Cottage! Reclamation Road!

M. rigidula Desr. (*M. Gerardi* Kit.). Similar places; rare; 3–6. Facial veins running into a marginal band instead of a lateral nerve, spines stout, though less so than in *M. truncatula*, and radial, not axial. It somewhat resembles *M. nigra*, but has stouter spines, neither grooved nor uncinate. I. Reclamation Road!

M. littoralis Rohde. Usually in deep sand; very common; 3-6. Veins as last, stems very long, straggling, fruit usually with

few irregular radial spines, often curved and uncinate, varying much in length.

†Var. *inermis* Moris. Spines none or reduced to tubercles. Known from *M. tornata* by flat faces and thick edge of spirals. II.!

Var. *breviseta* DC. Spines equal to, or shorter than, diameter of spiral. A common form. I. Reclamation Road! II.!

Var. *longiseta* DC. Spines longer than diameter of spiral. The commonest form. I.! II.! III.!

†*M. turbinata* Willd. Waste sandy and grassy places; rare? 3–6. Very pubescent, pods rather large, tub-shaped, spines reduced to tubercles. *M. tuberculata* Willd. is very near this, but has aristate, not muticous, peduncles, and glabrous pods flat at base. III. i. At Carteia! By Lajo near upper ford!

Var. *aculeata* Gaertn. (*M. olivæformis* Guss.) has a spiny pod. I. Sandy fields near the Neutral Ground, *K.* III. ii. Algeciras, *Wk.*

M. Murex Willd. var. *sphærocarpa* Bertol. Similar places; rare? 3–6. Even nearer last than *M. tuberculata*, but pod glabrous, rounded at both ends. II. Sandy fields on Neutral Ground at foot of Fort San Felipe, *D.* III. ii. Algeciras, *Fritze, Rev.* Near San Bernabe, very glabrous, with short radiating spines!

M. hispida Gaertn. Similar places; common; 3–6. Spirals lax, hardly contiguous, spines radiating, grooved, and usually uncinate.

Var. *denticulata* Urb. (*M. denticulata* Willd.) has only 1–3 turns of spiral. III. iii. Near Los Barrios Station!

Var. *pentacycla* Urb. (*M. nigra* Willd.) has 5–6 turns and long spines. One of the largest and most conspicuous species. *M. Terebellum* Willd. differs only in its shorter spines, and *M. lappacea* DC., which may occur, in fewer (3–4) turns. I. *K.*, as *M. Terebellum.* Reclamation Road! Below Mediterranean Road! II. *K.*, *D.* III.!

M. coronata Desr. Similar places; rare? 3-6. Spirals as last, but fruit very small, of one or two turns, with short pectinate spines parallel to axis. I. *K.*

M. minima Lamk. Similar places; frequent or common; 3–6. Much smaller, fruit globose, with long fine spines radiating spherically. I.! III.!

Melilotus parviflora Desf. Fields and waste places; frequent; 3–6. Flowers usually very small, fruit globose, very coarsely reticulate. Large-flowered forms look very like *M. elegans*. I.! III. i. Slopes of San Roque, *D.* ii. Railside near Algeciras! Near Reina Cristina, quite prostrate!

†*M. alba* Desr. Rough slopes; rare; 4–5. III. ii. By the Lobo!

†*M. elegans* Salzm. Fields and waste places; frequent; 3–5. Fruit ellipsoid, transversely rugose. Seen in more stations than those noted. I. Sandpits! Reclamation Road! East slopes below Middle Hill! III. ii. Marsh near Palmones Pinar!

M. sulcata Desf. Similar places; very common; 3–5. Fruit with fine regular concentric ribs. I.! III. i. and ii.!

†Var. *angustifolia* Willd. with small flowers and narrow leaves, much resembling *M. parviflora*. I. Reclamation Road! Dockyard!

Var. *major* Camb., much larger and stouter, with broader leaves, and larger flowers. I. North Front, *Boiss.* II. A prostrate form! III. i. At foot of San Roque, *Boiss.* ii. Near Reina Cristina! El Saladillo!

†*M. infesta* Guss. Similar places; rare; 4–5. Fruit ribs fewer, wider, much less regular. I. *Winkl.*

†*M. messanensis* Desf. Wet grassy places and marsh borders; locally common; 3–5. Racemes short, axillary, very shortly peduncled, fruit very large. III. i. Punta Mala! III. ii. Marsh at Palmones Playazo! iii. Salt Pans!

†*Trifolium filiforme* L. Grassy places; rare; 4–6. Like next, but heads fewer flowered and laxer, pedicels longer than calyx tube, petiolule of terminal leaflet not or little longer than those of lateral. III. ii. By upper aqueduct!

T. minus Sm. Grassy places; occasional; 4–6. Flowers smaller than next, standard smooth, keeled, wings not diverging. More general than my records show. III. i. Bonel's Farm! Campamento Common! Alcadeza Ravine! iii. Guadarranque Marshes!

T. procumbens Sm. Dry bushy or stony places; very common; 4–6. Standard flat, strongly striate, spoon-shaped at tip, wings diverging. Very variable. Not synonymous with *T. agrarium* L. as Debeaux supposes. I.! II.! III.!

Var. *majus* Koch (*T. campestre* Schreb.). Erect, heads large and bright yellow, usually retaining their colour when dry. I. Moorish Wall!

Var. *minus* Koch (*T. procumbens* Schreb.). Often decumbent, flowers paler, drying whitish, peduncles shorter. Usually regarded as type. I. Signal Station! III. i. Wooded slopes of San Roque, *Boiss.*

T. repens L. Damp grassy places and by watercourses; rather common; 4–6. I. Roadsides and ditches, *K.*, *D.* III.! Reaches the mountains!

T. isthmocarpum Brot. Grassy places; locally frequent; 4–6. Flowers dull rather deep rose, pedicelled, bracteolate. II. *Munby*! III.! chiefly in ii.!

†*T. Jaminianum* Boiss. Similar places; rare; 4–6. Very near last, if not synonymous; a specimen at Kew from the original station at Algiers shows hardly any difference. Flowers white, calyx segments narrow, unequal, longer than tube, free part of stipules longer. III. ii. Algeciras, *Porta & Rigo.*

T. nigrescens Viv. Dry grassy places; locally abundant; 4–6. Like *T. repens*, but annual, not creeping, heads smaller, on axillary, not long pseudo-radical peduncles; corolla white, not pink as described. I.! II.! III. i. From North Front to Campamento!

T. glomeratum L. Rough banks and grassy places; rather rare; 4–6. Heads globose, sessile in nearly every axil. Known from *T. scabrum* by rose, not white flowers, bracteolate, not quite sessile, and pubescence not scabrous. III. i. West slopes Queen

of Spain's Chair! Road to Bonel's Farm! Alcadeza Crags! ii. Valley north of Waterfall!

†*T. cernuum* Brot. Damp grassy places; very rare; 4–5. Heads small, lax, shortly peduncled, flowers white, soon deflexed, calyx teeth long, rather slender, spreading, longer than corolla, leaf-teeth setaceous, terminal seta long. III. iii. A single plant in Palmones Sands!

†*T. suffocatum* L. Dry grassy places; rare; 3–5. Heads very small, sub-basal in axils of long petioles. I. On *débris* of forts, *D.*, *Rev.* Path below Breakneck Battery!

T. strictum L. Grassy places; rare; 5-6. Erect, leaves narrow, bright glossy green, denticulations glandular, stipules very broad, corolla rose. III. i. Near ford to Pine Wood Plains! ii. Near Algeciras, *Rev.* Valley near Saladillo!

T. resupinatum L. Grassy places; very common; 3–6. Annual, heads small, corolla bright rose, inverted, calyx inflated and woolly in fruit, upper teeth much larger than lower, projecting from the wool. I. Europa Flats! II.! III.! Occasionally with white flowers!

T. tomentosum L. Similar places; equally common; 3–6. Like last, but corolla normal, fruit calyx quite hidden in wool. I. Below Victoria Battery! Near Michael's Cave! Rock Gun! North Front! II.!? III.!

T. fragiferum L. Similar places; less common; 5–7. Perennial, flowering much later, flowers much paler pink, heads larger, calyx less woolly, upper teeth about equal lower, slightly projecting. I. *K.* III. i. Railside beyond San Roque! By Lajo in many places! ii. Carnero and Algeciras Hills! Near El Cobre! iii. Palmones Sands! Guadacorte Marsh!

T. striatum L. Similar places; rare; 4–6. Standard and wings connate with stamens into a long tube. III. ii. Near Algeciras, *Rev.*

†*T. pratense* L.? Similar places; rare, or error; 5–6. I. *K.* III. i. San Roque, *D.* ii. Algeciras, *D.*

T. bæticum Boiss. Woods and bushy places; locally rather frequent; 4–6. Heads large, flowers white or pale cream, rarely pinkish. III. i. Almoraima! Path from San Roque to First Pine Wood! Alcadeza Crags! ii. Beyond El Cobre! Carnero Hills!

T. angustifolium L. Dry grassy places; common; 4–5. Heads very long, cylindrical, leaflets long and narrow. I.! III.!

T. stellatum L. Rough waste or grassy places; very common; 3–6. Heads subglobose, calyx segments stellately spreading in fruit. I.! III.!

T. lappaceum L. Dry grassy places; frequent or common; 4–5. Heads peduncled, calyx teeth little plumose, leaf sheaths long and strongly nerved. III.!

T. Cherleri L. Similar places; common; 4–5. Heads sessile, very plumose, with very broad involucrating stipules. III.!

T. albidum Retz. (*T. squarrosum* DC., *T. panormitanum* Presl.). Damp grassy places and roadsides; occasional; 4–5. Stout,

rigid, with rather large heads of yellowish- or greenish-white flowers on axillary peduncles, calyx segments indurated in fruit, lower tooth very long and strongly deflexed, stipules very long. III. i. Roadside near San Roque! Near First Venta! Path to S. Lorca! ii. Path to El Cobre! Watercourses below El Saladillo! Carnero Hills! iii. Near Guadacorte!

T. leucanthum M. Bieb. Similar places; rare; 5-6. Allied to last, but much smaller, heads very longly peduncled, mostly terminal. III. ii. Near Algeciras, *Porta & Rigo.*

T. maritimum Huds. Damp grassy places, often remote from sea; common; 4–6. Glabrous, heads terminal, ovoid, flowers dull rosy, calyx closed at throat. II.! III.! especially in ii.!

†*T. Juliani* Batt. (*T. Xatardi* DC.?). Similar places; rare; 4–6. Probably only a variety of last with subequal calyx teeth. III. ii. Near Algeciras, *Porta & Rigo.*

T. ligusticum Balb. Shady places; rare; 4-6. Resembles *T. lappaceum*, but with cylindrical, not globose heads, occasionally twin, and shorter, broader, less strongly nerved leaf sheaths. III. ii. In one or two valleys in the mountains!

T. arvense L. Dry sandy fields and hills; rather frequent; 4-6. Usually erect, slender, pale green, with rather small ovoid white plumose peduncled heads. II. *D.* III. i. Campamento Common! Near Soto Gordo! Field beyond Almoraima! Lajo Valley! ii. Palmones Pinar! iii. Palmones Sands! About Guadacorte!

T. Bocconi Savi. Dry rough places; rare; 4–6. Heads small, few, sessile, axillary and terminal, often twin, with pale flowers, calyx open at throat, lowest tooth twice as long as others. III. i. Alcadeza Crags! ii. Near Algeciras, *Rev.*

T. scabrum L. Roadsides and dry places; abundant; 3–6; Usually prostrate, with sessile axillary heads of small white flowers, calyx closed, much indurated and nerved in fruit, with rigid divaricate teeth. I.! II.! III.!

†*T. subterraneum* L. Grassy places; common; 2–6. I. Europa Flats! II.! III.!

†*Anthyllis Vulneraria* L. Dry banks and grassy places; locally frequent; 3–5. The type with pale yellow corolla and concolorous calyx is rare. II. *D.*

Var. *rubriflora* DC. Calyx wholly or partly purple, corolla yellow or red. I have only seen it yellow. I. Mediterranean Steps and slopes below! III. i. Everywhere on slopes of San Roque and Fort San Felipe, *K.*, *D.* ii. S. de Palma, *K.*, *D.* Carnero Point, and scattered to hill tops!

A. cytisoides L. Dry bushy slopes; locally frequent; 4–6; Shrub, 4–6 ft. high, like a *Cytisus*, flowers in rather long dense racemes. III. i. Cork Wood Crags!

Physanthyllis tetraphylla Boiss. Rough slopes and grassy, sandy places; common; 3–5. I. Chiefly south! III. Reaching high up mountains!

Cornicina Lœflingii Boiss. Uncultivated fields; rare; 5–6. Differs from next in much longer peduncles, lateral leaflets few,

smaller than terminal, pod annulate. III. ii. Algeciras, *Née*, *Webb*.

C. hamosa Boiss. In deep sand; locally common; 4–5. I. Catalan Bay! III. i. Pine Wood Plains near Lajo! Cork Wood Crags! ii. Palmones Playazo! iii. Palmones Sands!

Dorycnopsis Gerardi Boiss. Bushy and heathy places; rather rare; 5–6. III. i. Queen of Spain's Chair! By Lajo at Pine Wood Plains! Alcadeza Ravine! ii. By Miel below El Cobre! iii. Palmones Village, *Rev*.

Bonjeania recta Reichb. Marshy places and by rivers; frequent; 5–6. III.! Very abundant in marsh beyond Almoraima!

B. hirsuta Reichb. Dry bushy slopes; rather rare; 4–6. III. i. Magazine Hill! Long Stables Ravine! Path to First Pine Wood! Near Alcadeza!

Tetragonolobus purpureus Moench. Open slopes and grassy fields, especially cultivated; frequent; 3–4. I. Chiefly north-west slopes! Windmill Hill, *K*. Near Inundation, *K*. III. i. and ii.!

†*T. pseudo-purpureus* Uechtr. Similar places; rare; 3–4. Differs in shorter pod with shorter and broader wings. Porta & Rigo's specimen at Kew looks like a mere variety of last. My 519 from Middle Hill may be this. III. i. Field borders near San Roque, *Porta & Rigo*. ii. Meadows near Algeciras, *Fritze*, *Winkl*.

†*T. conjugatus* Ser. Similar places; rare; 3–4. Flowers smaller and paler, pod much more slender, not winged. III. ii. Meadows near Algeciras, *Fritze*, *Winkl*.

†*T. siliquosus* Roth. Similar places; rare; 5–6. Perennial, with large solitary yellow flowers on long peduncles, pod narrowly winged. I. *Lag*.

†*Lotus edulis* L. Dry sandy or grassy slopes; common; 3–5. Flowers 1–2, pod much inflated. I.! III. i. and ii.! Reaches Carnero Point!

L. ornithopodioides L. Similar places; common; 3–5. Flowers several, smaller, with long pendulous pods. I.! III.!

L. cytisoides L. Dry rocky and bushy places; locally abundant; 3–5. Like *L. corniculatus*, but in larger laxer patches, often subscandent, wings connate in front. A form with pale or whitish yellow flowers occurs. I.! III. i. Ruins of Carteia! Slopes of San Roque, *D*.

L. creticus L. Sand dunes; rather frequent; 2–7. Large, prostrate, leaves silvery-silky, flowers large. *L. Salzmanni* B. & R. and *L. commutatus* Guss. are varieties differing chiefly in form and relative lengths of calyx teeth. I. A plant or two at Lighthouse! Catalan Bay! North Front Sentry Fence. II.! III. ii. Palmones Playazo! Sandy Bay! iii. Palmones Sands!

L. corniculatus L. Dry grassy places; rare? 3–5. Perennial, differing also from *L. arenarius*, which often closely resembles it by its entire styles. I. Signal Station Road! A very large form like *L. uliginosus*, which the Rev. E. S. Marshall thinks near var. *crassifolius* Pers. This may be the form mentioned by Kelaart in Fl. p. 98, as near *L. major* Scop. III. i. Beyond Alcadeza Crags! Cork Woods!

Var. *hirsutus* Koch is a more hairy variety. I. Dry grassy slopes in south and west, *K.*, *D.*

†*L. uliginosus* Schk. Damp bushy places; rare; 4–6. Much taller and stouter, tips of calyx teeth divergent in bud. III. ii. By streamlet above El Cobre!

L. arenarius Brot. Dry sandy places, often in deep sand; locally common; 3–7. Annual, with flowers inclining to orange, styles bifid. I. *K.*! II. Very abundant! III. i. Towards Pedrera!

Var. *major* Wk. By description this differs chiefly in size, but *L. canescens* Kunze, cited as synonymous, is densely covered with yellowish tomentum and looks very different. I. Jews' Cemetery!? A glabrous plant as stout as *L. uliginosus*, with the bifid style of *L. arenarius*, and differing from both in its long narrow calyx tube, with teeth much longer than tube.

L. angustissimus L. Sandy ground; rare? 4–6. Differs from next in several unstable characters, the most constant being its long slender fruit, 3½–5 times as long as calyx. Young examples placed to *L. hispidus* may belong here. II. Damp sand, *Boiss.*, *D.* III. ii. Algeciras, *ib.*

L. hispidus Desf. Sandy places, and in woods; common, at least locally; 3–6. Fruit not more than 2½ times calyx or less, thicker than in last. The corolla often turns green after drying, but this may not occur for months. III. i. Pindalista! ii. Near Cortijo Trinidad! M. de la Torre! Mountains! iii. Guadacorte and Guadarranque Marshes!

L. parviflorus Desf. Dry or wet places on heaths and open mountain slopes; locally common; 3–6. Petals and fruit scarcely longer than calyx. The corolla ultimately often turns green, as in last, but this is not a constant character. I. Behind the Mount, *K.* Probably the reference on p. 60 to *L. angustifolius* refers to this. III. i. Bonel's Farm! Alcadeza! Pine Woods near San Roque, *Wk.* ii. Mountains!

Psoralea bituminosa L. Rough or bushy places; common on Rock, much less so in Spain. It varies much in size. I.! III. i. Alcadeza! ii. Algeciras! In the mountains! M. de la Torre! Carnero Hills!

Var. *latifolia* Moris (*P. plumosa* Rchb., *P. palæstina* Mor.) is a large form, which Perez Lara does not distinguish even as a variety. I.! III. ii. Algeciras, *Rev.*

Galega officinalis L. Bushy places by streams; rather common; 4–5. III. i. Lajo Valley below Almendral! A large mass in field beyond Almoraima, and elsewhere! ii. and iii.!

Astragalus epiglottis L. Dry sandy places; rare; 3–5. Annual, with bicuspidate, centrifixed hairs, flowers very small, whitish or pale yellowish, turning blue, in dense axillary, very shortly peduncled heads. I. *Lag.*, *Winkl.* III. iii. Palmones, *Rev.*

A. pentaglottis L. Dry gravelly places; occasional, or locally frequent; 4–5. Flowers pinkish purple, in dense round heads, on very long peduncles. III. i. Opposite Francia's Farm! Carteian Hills! Between San Roque and First Pine Wood! North of San

Roque! ii. Railside and adjacent fields near Algeciras! Carnero Hills!

†*A. algarbiensis* Coss. Sand dunes; very local; 4–5. Annual, with yellow flowers in very short racemes on very long axillary peduncles, racemes elongating in fruit, fruit obliquely ovoid, apiculate, glabrous. III. iii. Sandy hillock west of Guadacorte Marsh!

A. hamosus L. Dry gravelly places; rather frequent; 3–5. Like next, but smaller and more diffuse, with falcate pods. I.! II. *D.* III. i. Slopes of Fort San Felipe, *D.* River bed above Almoraima! ii. Algeciras, *Rev.* iii. Near Salt Pans!

A. bœticus L. Similar places; equally frequent; 4–5. I. Rock and North Front! II.! III. i. About San Roque! ii. Algeciras, *Rev.* Carnero Hills!

[*A. depressus* L., communicated to Kelaart by Lemann, was probably an error, though he is usually accurate. It is not known in the province, nor is it North African.]

A. lusitanicus Lamk. (*Phaca bætica* L.). Woods and shady places; rather rare; 2–4. A large coarse species, with racemes of large white flowers, and much inflated pods. [I. Cultivated? *K.*] III. i. Spanish racecourse, *D.*; not there now. Sandy fields at San Roque, *D.*, *K.* Cork Woods!

Biserrula pelecinus L. Cultivated and fallow fields; rare; 3–6. Pods long, pendulous, scalloped. III. i. Near San Roque, *Brouss.*

Scorpiurus sulcata L. Cultivated and rough fields; abundant as an aggregate; 3–6. The type has spiny pods, the convolutions all in one plane. The floral characters are quite unreliable. I only cite stations where I have collected the varieties. I. Dockyard! Europa Glacis!

Var. *subvillosa* P. L. Pod very similar, but convolutions very irregular and not in one plane. As abundant as type. I. Levant! Sandpits! III. i. Beyond Bonel's Farm! ii. Railside near Algeciras!

Var. *muricata* P. L. Spines very short, or reduced to tubercles. Decidedly rarer. III. i. Campamento Common! Near S. Lorca!

S. vermiculata L. Similar places; abundant in Spain; rare on Rock; 3–6. Spines cylindrical and densely contiguous, covering the whole pod. I. Rare, *K.* II.! III.!

Coronilla glauca L. Bushy places and ravines; frequent on Rock; 1–3; rare in Spain; 3–5. I. Chiefly about Mediterranean Steps, and above Lower Lines, scattered elsewhere! III. i. Ravine near Long Stables!

C. juncea L. Similar places; locally common; 3–5. III. i. Cork Wood Crags!

[*Hippocrepis comosa* L. is recorded from San Roque by Kelaart only.]

†*H. unisiliquosa* L. Grassy places; rare; 3–5. III. i. Orchard by Arroyo Viejo, below Malaga Gardens!

H. multisiliquosa L. Dry places and cultivated soil; rather common; 3–5. I.! III. i. and iii.!

Ornithopus repandus Poir. Dry gravelly or sandy places; local or rather rare; 3–5. Annual, lower leaves simple, rest pinnate, with the lower pair of pinnæ large and stipuliform, true stipules minute. III. i. Cork Wood Crags! Near Second Pine Wood! Almoraima! Bonel's Farm!

O. scorpioides L. Similar places and in cornfields; locally common; 3–5. Closely resembling last, but leaves trifoliolate, lowest pair stipuliform, the terminal very large. III. i. About Pinar de los Bigotes!

O. ebracteatus Brot. Sandy fields; frequent; easily overlooked; 3–5. III.!

O. compressus L. Similar places; very common; 3–5. I. At foot of Rock, *Lem.* II.! III.!

O. roseus L. (*O. sativus* Brot.). Sandy places; very common; 3–5. Pods straight, with contiguous joints, beak curved, by description as long as last joint, but I find it usually twice as long. III.!

Var. *macrorhynchus* P. L., has beak 3–4 times as long as last joint. III. i. Almoraima, *Porta & Rigo.*

Var. *isthmocarpus* P. L. Pod much curved, joints separated by a distinct isthmus, beak 3–4 times last joint. I. Uncultivated sands at Gibraltar, *Brouss.* III. ii. Algeciras, *Rev.*

Hedysarum capitatum Desf. Dry gravelly hills; occasional or locally common; 4–5. Annual, with deep rose, not crimson flowers. III. i. Opposite Francia's Farm! Carteian Hills! Alcadeza Plain!

H. coronarium L. Fields and hills; abundant in Spain; 4–6. I. Very rare, *K.* III.! Certainly not abundant in Cork Woods, as Debeaux reports; I have not seen it there.

H. humile L., var. *majus* Lge. (*H. Fontanesii* Boiss.). Bushy places; rare; 3–5. Leaves much narrower, stipules connate. III. i. Near San Roque, *Boiss.*

Onobrychis eriophora Desv. Sandy ground; rare; 4–6. Resembles *Hedysarum coronarium* but smaller, with much smaller narrower leaflets, and pod of one woolly joint. III. ii. S. de Palma, *B. & R.* ii. or iii. Sands by Palmones River, *B. & R.*

Vicia sativa L. Bushy places; frequent; 3–5. A protean species, not always easily separable from *V. angustifolia.* I.! II.! III.!

Var. *macrocarpa* Moris. Flowers 1 in., pods 2–2½ in. by 3–5 lines, prominently reticulate. Perez Lara says this is the most frequent form, and it is the only one admitted by Debeaux, but I have not identified it. III. Between the Neutral Ground and Algeciras, *K., D.* i. Slopes of San Roque, *ib.*

Var. *cordata* P. L. Lower leaves obcordate, upper bilobed, flowers 6–7 lines, pods 1¼–2 in. by 2–3 lines, reticulate, but not prominently. I think common. I. Near Willis's! Mediterranean Steps! III. ii. S. de Palma, *Rev.* My 2012 from near El Saladillo has very peculiar leaflets 1 in. by ½ in., with a long cuspidate apex, not retuse. It resembles nothing I know.

V. angustifolia Roth. Similar places; frequent, but less so than last; 3–5. Smaller in all its parts, with narrow more cylindrical pods. III.!

Var. *segetalis* Thuill. Usually regarded as the type, has obcordate or oblong-lanceolate leaflets. III. i. Queen of Spain's Chair! ii. Palmones Pinar!

Var. *Bobartii* Forst. Upper leaves or all with narrow linear leaflets. Perez Lara takes this as the type. III. ii. Waterfall! My 1998 is a very narrow-leafleted form!

V. hybrida L. Cultivated or waste places and roadsides; occasional or rare; 3–5. Closely resembles *V. lutea*, but standard villous on back, and leaflets usually truncate or retuse. I. *Wk.* Foot of Mediterranean Steps! III. i. Foot of San Roque, *D.*

V. lutea L. Similar places; occasional; 3–5. Flowers very pale yellowish, rarely slightly washed with violet, standard glabrous, leaflets acute or acuminate, not retuse. Only the var. is recorded by Debeaux. I. Above Willis's! Sandpits! III. i. Near Linea Cemetery! About Almoraima!

Var. *hirta* Boiss. Much more pilose, with longer denser hairs on pods. III. i. or ii. Cultivated and sandy fields by Guadarranque, *D.*

V. vestita Boiss. Mostly in cultivated fields and railway banks; frequent, 3–5. Flowers not yellow as described, but rather dark purple, wings and back of standard dull yellowish. III.!

†Var. *tuberculata* Wk. Pod with large scattered tubercles bearing long white hairs. This only is recorded by Debeaux, though the type is more common. III. i. Marshy places in sand desert, *D.* ii. Algeciras, *Winkl.* My 662 from railside may be this.

†*V. onobrychioides* L. Wooded slopes; rare; 5–6. A climbing perennial, with long peduncles bearing 6–12 large violet flowers, with paler keels, calyx tube straight, pod long, 5–10-seeded. III. ii. Near Algeciras, *Winkl.*

†*V. cassubica* L. Similar places; rare; 6–7. Like last but erect, with more numerous flowers on peduncles shorter than leaves, pod short, rhomboid, 2–3-seeded. III. i. About San Roque, *Brouss.*, *Lag.*, *Durand.*

†*V. tenuifolia* Roth. Shady ravines; rare; 5–6. Perennial, calyx tube obliquely truncate or rounded at base, not saccate. Very like *V. Cracca* but stouter, peduncles longer than racemes, the whole longer than leaf, flowers pale blue, limb of standard longer than claw. III. i. South slopes of San Roque, *D.*

V. Cracca L. Woods and bushy places; locally frequent; 4–7. Flowers shorter, violet blue, standard shorter, limb as long as claw, peduncles shorter than or equalling raceme, the whole rarely longer and often shorter than leaf. III. i. Near Almoraima! Long Stables Ravine! ii. M. de la Torre! Mountain Valleys! A white flowered form occurs!

V. varia Host. Wooded and bushy places; rare; 4–6. Near last, but annual or biennial, calyx saccate at base, corolla larger, violet, with wings paler or whitish, standard shorter than claw. III. i. Almoraima, *P. L.* About San Roque, *Boiss.*!

V. villosa Roth. Similar places; rare; 5–7. Very near last, but flowers opening in succession from bottom, not all simul-

taneously, raceme plumose in bud, lower calyx teeth longer and narrower, and corolla wholly blue. III. i. Lajo bed above upper ford! Alcadeza Crags! Above Almoraima Station!? ii. S. de Palma above Algeciras, *Fritze.*

V. pseudo-cracca Bertol. var. *multiflora* P. L. Similar places; rare; 5–6. Near last. The type has only 3–6 flowers, blue with yellow wings, but the var. with 8–20 blue flowers seems indistinguishable from *V. villosa.* III. ii. Garganta del Capitan, *P. L.*

V. atropurpurea Desf. Dry fields and bushy places; occasional; 4–5. I. *K.* II. A single plant! III. i. Bonel's Farm! Pine Wood Plains! Almoraima! Carteia, *K.* ii. Palmones Pinar, &c.! iii. Guadacorte!

†*V. bœtica* Lge. Rough bushy places; locally common; 5–6. A straggling climber, with pale blue and white flowers. III. ii. Wooded hills above Algeciras, *Fritze, Winkl.* Near Carnero Point and in Frayle Valley!

†*V. disperma* DC. Sandy fields; rare; 4–5. Peduncles aristate, flowers small, style laterally compressed, bearded under apex only, pod obliquely truncate and beaked at apex. III. ii. Near Algeciras, *Rev.*

V. gracilis Lois. Damp grassy places; frequent; 4–5. I. Bushy places, *K.* III.! Abundantly in Guadacorte Marshes!

V. pubescens Boiss. Bushy places; usually in woods; locally abundant; 4–5. Peduncles muticous, pod 4–6-seeded. III. i. East slopes Chair! Long Stables! ii. M. de la Torre! Mountains!

[*V. Ervilia* Willd. is cultivated about San Roque and Algeciras.]

Lathyrus Clymenum L. Bushy places and cornfields; rather frequent; 3–5. There are two colour forms; one has a dark purple standard with paler bluish wings, the other a dull cherry red standard with lavender wings, or more rarely a bluish pink standard and white wings (*L. articulatus* L.?). The former is the prevailing form on the Rock and in uncultivated soil, the pale one usually in cornfields.

Var. *latifolius* Godr. with oblong lanceolate leaflets, and var. *tenuifolius* Godr. with linear lanceolate ones grow together, the former the commoner on the Rock. I! III. i. and ii.! The dark form is rarer, that with white wings only on railway near Algeciras!

L. Ochrus L. A weed of cultivation and by roadsides; frequent; 3–5. I. *D.* III. i. and ii.!

L. Aphaca L. Waste and cultivated places, bushy hills and woods; rather frequent; 3–6. I. Gardens, even in the Town, *D.* III. i. About Almoraima and Long Stables, &c.! ii. and iii.!

L. annuus L. Sandy and gravelly hedgebanks and grassy places; occasional; 4–6. III. i. Campamento Common! Almoraima! Between Neutral Ground and Guadarranque, *D.* ii. Seen but no stations noted! iii. About Salt Pans!

L. Cicera L. Cultivated fields and bushy places; rare? 3–5. Flowers crimson or scarlet, peduncles muticous, pods large oblong. Differs from *L. setifolius* in size, and in style twisted so as to

appear flattened laterally at apex. III. i. Slopes of San Roque and Queen of Spain's Chair, *D.* iii. Railside at Guadacorte!

*†*L. sativus* L. Cultivated fields, also in woods; occasional; 3-6. Flowers turquoise blue and white. III. i. and ii.! Sometimes a field full. Cork Woods about Almoraima, rare!

*Var. *stipulaceus* Wk. (*L. quadrimarginatus* Bory & Chaub. var. *amphicarpos* Wk.). Flowers blood red, pods winged back and front. III. Near Gibraltar, *Lag.*

L. hirsutus L. Damp grassy or marshy spots; occasional; 4–6. Flowers dark violet, pods very hispid or villous. III. i. Beyond Almoraima Station! ii. Railside near San Bernabe, with broad leaflets! Near El Saladillo, with narrow leaflets! iii. Guadacorte Marshes! Salt Pans!

L. tingitanus L. Bushy places; rare; 4–6. Flowers large, deep crimson, keel with a long narrow beak. I. *K.*, *D.* III. i. Between Linea and S. Carbonera, *Porta & Rigo*! ii. Algeciras, *Rev.* By Arroyo Gaba! Railside towards M. de la Torre!

[*L. odoratus* L. has been found as an escape at Algeciras by Reverchon.]

L. latifolius L. Bushy places and woods; frequent; 5–6. Varies considerably in width of leaflets, but I have not seen good var. *angustifolius*. III. i. Cork Woods! Arroyo Viejo! Alcadeza! ii. Carnero Hills! iii. Guadacorte Marshes!

L. angulatus L. Grassy places; rare? 3–5. A small annual with purple or violet, not scarlet flowers, peduncles awned, much longer than petioles, pods linear, seeds angular, tuberculate. I. *Finlay*! III. i. Andalucian Racecourse! Bonel's Farm! ii. Algeciras, *Winkl.*, *Rev.* Almoraima, *Porta & Rigo*!

L. sphæricus Retz. Similar places; rare; 3–5. Very similar to last, but usually larger, flowers scarlet, peduncles as long as or longer than petioles, seeds globose, smooth. III. i. About Almoraima and Long Stables!

L. setifolius L. Rough bushy places; rare? 4–5. Flowers scarlet or brick red, peduncles muticous, pods rhomboid. Known from *L. Cicera* by its smaller size, and style not twisted. I. *Lem*! Above Willis's! Above Engineer Road!? III. ii. About Waterfall!? No specimens kept from stations queried.

[*Pisum arvense* L. is an occasional weed in cultivated fields. Seen also at Sandpits.]

[*Erythrina Corallodendron* Willd., *Dolichos lignosus* L., *D. purpureus* L., *Acacia Farnesiana* Willd., *Gleditsia triacanthos* L., *Cercis siliquastrum* L., and *Ceratonia Siliqua* L. are all cultivated species, but the last-mentioned occurs subspontaneously about San Roque.]

Rosaceæ.

Rubus ulmifolius Schott (*R. discolor* W. & N.). Bushy places; common, often very abundant; 4–10. I can only distinguish one fairly constant species, which the Rev. W. Moyle Rogers thinks best under this name. I. Engineer Road! Lower Lines! III.!

Var. *amœnus* P. L. is regarded as the usual form, common throughout Andalucia, but no specimens I have examined agree with Debeaux's description in Fl. p. 78. III. ii. Algeciras, *Rev.*

Rosa sempervirens L. Bushy places; especially by water-courses; frequent; 5–7. III.! Especially common in Cork Woods!

R. micrantha Sm. Bushy places; rather rare; 4–6. The segregate was named *R. septicola* Déségl. for me by Prof. Dingler. III. i. By Lajo near Second Pine Wood! About Almoraima! ii. By Miel from near source to below El Cobre!

[*R. canina* L. recorded by Kelaart is not a native of Gibraltar.]

[*Amygdalus communis* L. occurs subspontaneously, more frequently beyond our limits. A tree or two grows some way above Ince's!]

†*Spiræa flabellata* Guss. Bushy hills; rare; 5–6. III. i. S. Carbonera, *Rev.*

[*Fragaria vesca* L. recorded by Kelaart as cultivated in Gibraltar gardens.]

†*Potentilla Tormentilla* Sibth. Bushy places in mountains; locally frequent; 3–6. Only var. *elatior* Lehm. is given by Debeaux. It is taller, leaves with broader segments, and stipules tridentate, but I have seen nothing different from the usual British form. III. ii.!

P. reptans L. Damp grassy hollows and stream beds; frequent; 4–7. III.! Frequently not flowering.

Agrimonia Eupatoria L. Damp bushy spots and by streams; frequent; 4–7. III.!

†*Alchemilla arvensis* Scop. In short grass in rather dry places; frequent; 3–5. I have only seen small forms resembling *A. microcarpa* B. & R. in short calyx limb, but the fruit is ovoid, not subglobose. III. i. First Pine Wood! Cork Woods! ii. Mountains to Guadalmeci!

Poterium verrucosum Ehrenb. (*P. mauritanicum* Boiss.). Dry roadsides and fields; frequent; 4–5. Glabrous or densely pilose below, fruit obsoletely tetragonous, densely and coarsely tuberculate. I. About Willis's, &c.! Engineer Road! II.! III.!

Var. *Magnolii* P. L. Fruit more angular, ribs more visible, but it hardly differs, and all I have gathered fit type best. III. i. South slopes Queen of Spain's Chair and San Roque, *D.* ii. S. de Palma, *D.*

P. multicaule B. & R. Bushy or heathy places on hills; locally frequent; 3–5. Much smaller, usually stemless. III. i. From Queen of Spain's Chair to Cork Wood Crags!

Cratægus monogyna Jacq. Bushy places and woods; frequent; 3–5. I.! III.! Abundant in parts of Cork Woods and at foot of Algeciras mountains, more rarely near summits!

[*C. maura* L. f. is now regarded as synonymous with last. It is at most a form with narrow cuneate leaves, trilobed at apex only. Good forms seem quite rare, but not confined to Rock.]

C. brevispina Kunze. Similar places; rare? 3–5. Differs from *C. monogyna* in little but purple-veined petals, and blood

red, not bright red fruit, and I suspect it is merely a form of that species. III. i. San Roque, *Wk.* ii. Algeciras, *Wk.* Mr. Druce tells me he has seen it at the latter station.

Pyrus communis L. var. *Mariana* Wk. Bushy hill slopes; occasional; 2–3. Only this variety is recorded. It differs in spinescent branchlets, ovate or oval-subrotund leaves, and turbinate globose fruit on very thick peduncles. I have not seen any named specimens; my own agree very closely with *P. cordata* Desf. in their small neat leaves, but that species is not recorded for Spain. [I. The type cultivated, *K.*] III. i. East slopes Chair, very small bushes almost buried in heather! Alcadeza Crags to Majarambout! ii. S. de Luna about Algeciras, *P. L.* iii. Sandy ground near Guadacorte Marsh!

**Cydonia vulgaris* Pers. is quite naturalized here and there, as beyond Almoraima and Long Stables, remote from buildings, also in Palmones Sands, small barren bushes looking quite native.

[*Prunus Armeniaca* L. and *Eriobotrya japonica* Lindl. are only cultivated.]

[Granataceæ.]

[*Punica granatum* L., as the remains of cultivation, looks native in several places on the Rock and in Spain.]

Myrtaceæ.

Myrtus communis L. Bushy places and woods; frequent or common; 6–7. III. i. Foot of Chair! Alcadeza Crags! Cork Woods! ii. Palmones Playazo! iii. Palmones Sands!

Lythrarieæ.

†*Lythrum Salicaria* L. Marshes and by rivers; type rare, var. rather frequent; 6–9. III. i. Behind Almendral, *K.*

Var. *tomentosum* DC. More canescent, spikes dense, villous tomentose. III. i. By Lajo in many places! Cork Wood Sotos! ii. Palmones Playazo! Carnero Hills! iii. Guadacorte Marshes, sometimes 6–8 ft. high!

L. Græfferi Ten. (*L. flexuosum* Lag.). Damp grassy places, roadsides, and ditches; very common; 4–8. II.! III.!

Var. *Preslii* Deb. Stem erect, simple, lower leaves rounded or subcordate at base, upper narrow. II. and III., *K.*, *D.*

L. Hyssopifolia L. In drier places; common; 4–6. Annual, flowers smaller, petals paler, 5–6, also stamens. II.! III. i. and ii.! My 1196, from sands near Pedrera, is small, subsimple, 2–3 in. high, and looks different.

L. thymifolia L. Dry light soil; rare; 5–6. Smaller and more slender, petals very small, 4, stamens 2. III. i. Near San Roque, *Ball*! ii. Railway near Algeciras! iii. Roadside near Los Barrios Station!

†*Peplis Portula* L. Marshes and ditches; rare? 5–6. Only the variety is recorded, but my only gathering is type. III. ii. Hills near San Bernabe!

†Var. *longedentata* J. Gay differs in its sessile flowers,

bracteoles longer than calyx tube, stipules large, often connate with base of tube, outer calyx teeth twice inner and gland-tipped. III. ii. S. de Palma, *Rev.*

†*P. erecta* Req. Damp sandy places; rare; 4–6. Erect, 1–2 in. high. III. iii. Palmones Sands!

Haloragieæ.

†*Myriophyllum alterniflorum* DC. Pools; rare; 4–5. III. ii. Near Palmones Pinar!

Onagrarieæ.

Œnothera stricta Ledeb. Deep sand; rather frequent; 4–6. I. *D.* II. *D.* III. i. Linea Sands! Punta Mala! Puente Mayorga! Near Rocadillo! iii. Guadacorte! Salt Pans!

Epilobium hirsutum L. var. *villosissimum* Koch. Marshes or by pools; locally frequent; 6–9. III. i. Cork Wood Sotos! iii. Guadacorte Marshes! Salt Pans!

†*E. Tournefortii* Michal. (*E. virgatum* Fr. var. *majus* Lge.). Hedges and ditches; occasional; 5–8. Allied to *E. obscurum* Schreb., but much taller, stouter, darker green, with the look of a glabrous *E. parviflorum.* III. i. By the Lajo! Railside near San Roque Station! ii. Roadside near Algeciras! El Cobre! iii. Guadacorte Marsh!

E. adnatum Griseb. (*E. tetragonum* L.)? Similar places; rare or error? 6–9. I suspect the last species has been mistaken for this. III. i. or iii. Marshes on banks of Guadarranque, *D.* Ditches at San Roque, *Pourr.*

E. parviflorum Schreb. Similar places; rare; 6–9. III. ii. At El Cobre, a very white villous form!

†*Isnardia palustris* L. Springs and running water; rare; 7–8. III. ii. S. de Palma, *Rev.*

Tamariscineæ.

Tamarix gallica L. River banks and wet places; rare? 4–5. Very like next, but racemes 1½–2 in. long, lax and slender, hypogynous disc with ten obtuse angles, filaments salient from them, anthers longly apiculate. [I. Cultivated, *K.*] II. At foot of Fort San Felipe, *D.*

T. africana Poir. Similar places; frequent; 3–4. Racemes shorter and denser, disc with 5 acute angles, filaments not salient, anthers muticous. [I. By North Front Cemetery, planted!] III. By rivers and at Salt Pans!

Cucurbitaceæ.

Bryonia dioica Jacq. Bushy places, hedges, and woods; occasional; 3–5. I. *K.* III. i. Near Fort San Felipe, *K.*, *D.* About San Roque and by river below Station! Cork Woods! ii. Arroyo Gabo, and elsewhere! Carnero Hills!

Ecballium Elaterium Rich. Dry rocky *débris*; locally common; 1–12. I. From Mediterranean Steps to Buena Vista! Near Michael's Cave!

PORTULACACEÆ.

Portulaca oleracea L. A weed in sandy gardens; locally frequent; 2–9. Hardly looks native, but Perez Lara does not question its status. III. i. Linea! ii. Algeciras Station! Near First Venta! iii. Salt Pans!

PARONYCHIACEÆ.

Corrigiola telephifolia Pourr. var. *foliosa* P. L. Dry grassy and stony fields; very common; 1–12. Between type and *C. littoralis*. I. *K*. III.!

†*Herniaria incana* L. Dry sandy soil; rare; 5-6. A whitish pubescent perennial, with very shortly pedicellate flowers, few in clusters or in short axillary racemes, sepals densely pubescent, edges and apex not ciliate. Easily confounded with *H. cinerea* DC., a frequent Cadiz species, but annual, clusters larger, flowers quite sessile, sepals with longer more rigid hairs and ciliate at apex. II. *K*., *D*. III. i. Railway beyond San Roque!? Perhaps *H. cinerea*.

†*Illecebrum verticillatum* L. Damp sandy places; rare; 2–7. III. i. Pools on Bonel's Farm! The floating form looks very like a *Callitriche*. ii. S. de Palma, *Rev*.

Chætonychia cymosa Wk. Dry gravelly and sandy places; occasional; 4–6. A small slender erect annual. I. *Boiss*. III. i. Queen of Spain's Chair near Pedrera! Linea, *K*. Alcadeza Plain! ii. or iii. Sands near Palmones, *Rev*.

Paronychia echinata Lamk. Dry sandy, stony or gravelly hills; rather frequent; 3–5. III. i. Queen of Spain's Chair to Alcadeza! iii. Palmones Sands!

P. argentea Lamk. (*P. hispanica* Clus.). In dry, mostly very sandy places; abundant; 1–5. I.! II.! III.! My 285 from Neutral Ground closely resembles this, but has narrow leaves, no petals, and muticous sepals. It may be a distinct species.

Lœflingia micrantha B. & R. In deep sand; very local; 4-6. A small glutinous, subleafless annual, very like *L. hispanica* in appearance, but with 5, not 3, stamens, and outer, not all, sepals aristate on either side. III. ii. and iii. Sands near Palmones, on both sides of river!

L. sp.? (No. 1716). A small slender leafy annual, apparently of this genus, just below cottage at Waterfall! I have not seen it in flower.

Polycarpon tetraphyllum L. f. Dry roadsides, sandy fields and waste places; abundant; 3–6. I.! II.! III.!

Var. *alsinoides* Gren. Less branched, flowers fewer, rather large, in small compact cymes. III. iii. Palmones Sands!?

Var. *floribundum* Wk. Much branched, flowers very numerous, in dense cymes covering whole plant. III. i. Bonel's Farm!?

CRASSULACEÆ.

Umbilicus pendulinus DC. Rocks, walls and banks; very common; less so on Rock; 5–6. Cauline leaves often laterally petioled, all crenate. I.! III.!

†Var. *truncatus* W.-Dod, in Journ. Bot. 1914, p. 12; has all leaves, even radical, laterally petioled, rather deeply lobed. III. iii. Roofs at Palmones!

U. horizontalis DC. Similar places; common, especially on Rock; 5–6. Flowers greenish white, ovoid, about 3 lines long, capsules long, lanceolate, acuminate. I.! III.!

†*U. citrinus* W.-Dod in Journ. Bot. 1914, p. 12. Sandy banks; rare; 5–6. Much taller, flowers long, cylindrical, yellow, capsules short, linear-oblong. III. i. By Almoraima Soto! Valley opposite Long Stables!

[*U. Winkleri* Wk. is now referred to *Sedum Winkleri*.]

Pistorinia Salzmannii Boiss. Sandy ground; locally common; 5–6. Flowers bright yellow inside, dull reddish outside. III. i. Cork Woods! By Lajo near Second Pine Wood! ii. Cortijo Trinidad! iii. Near Almoraima!

Sempervivum arboreum L. Rocks; locally common; 1–3. I. Bungalow! From Governor's Cottage to below Mediterranean Road!

†*Sedum amplexicaule* DC. Dry stony places; rare; 5–7. Inflorescence very lax, flowers distant, radical leaves setaceous. III. i. Neighbourhood of Gibraltar, *K*. Near San Roque, *D*.

S. altissimum Poir. Similar places; very common on Rock; occasional in Spain; 6–7. I.! III. i. Cork Woods! Alcadeza Crags! ii. Palmones Playazo!

S. acre L. Similar places; rare; 5–6. III. i. Duke of Kent's Farm, *K*.

S. brevifolium DC. Rocks on mountains; locally frequent; 5–6. III. i. Queen of Spain's Chair! Alcadeza Crags! ii. Mountains to summits!

†*S. micranthum* Bast. Stony places; locally common; 5–6. I.! III. ii. Valley north of Waterfall Valley! Only leaves seen.

†*S. Winkleri* W.-Dod in Journ. Bot. 1914, p. 12 (*S. hirsutum* var. *bæticum* Rouy; *Umbilicus Winkleri* Wk.). Rather damp rocks; locally frequent; 5–7. Flowers large, white, in a lax raceme, leaves and inflorescence glandular. Near *S. hirsutum* All., but petals connate in lower part. III. i. Summit of Chair! Alcadeza Crags! ii. Mountains to highest ridge!

Ficoideæ.

Mesembryanthemum nodiflorum L. Stony places; rare; 5–6. Leaves cylindrical, pustulate, flowers small, whitish. I. Europa Lighthouse and Glacis! Below Mediterranean Tunnels! III. ii. Algeciras, *D*.

M. crystallinum L. Similar places; rare; 4–6. Leaves flat, ovate, pustulate, flowers large, whitish. III. ii. Near Algeciras, *Née*.

[*M. Aitonis* Jacq., mentioned by Kelaart as cultivated in Gibraltar, is very near the last. I have seen neither.]

[*M. acinaciforme* L. with very large bright purple flowers is extensively planted on forts on the Rock, and about cottages in sand-dunes in Spain, and is becoming naturalized.]

[*M. crassifolium* L.? is planted at Governor's Cottage, and has become quite naturalized on rocks near the Lighthouse.]

[CACTEÆ.]

[*Opuntia.* One or two species are commonly cultivated and grown as hedges, occasionally growing subspontaneously.]

SAXIFRAGACEÆ.

Saxifraga globulifera Desf. var. *gibraltarica* Boiss. Rocks, old walls and stony *débris*; locally common; 3–5. I. Northern slopes and precipices from Rock Gun to Castle, and *débris* slopes below! Mediterranean Steps!

UMBELLIFERÆ.

†*Sanicula europæa* L. Shady woods; rare; 4–6. III. ii. Top of Waterfall Valley!

Eryngium ilicifolium Lamk. Sandy ground near sea; rare; 6–8. Annual with small heads. A specimen in herb. Balestrino so labelled, without locality, is *E. maritimum*, which Kelaart also records. I. North Front, eastern side, rarely, *K.* II. *K.* III. i. Linea, *K.*

E. tricuspidatum L. Dry fields and heathy places; occasional; 6–8. Radical leaves oval cordate, dentate, rarely lobed, cauline with narrow-linear segments, heads small, sessile. III. ii. S. de Palma in Los Barrios district, *Rev.*

E. maritimum L. Sea sand; occasional; locally common; 5–7. I. North Front! II.! III. i. or iii. Near R. Guadarranque, *K.*, *D.* ii. Sandy Bay!

E. aquifolium Cav. Cultivated or fallow fields; locally common; 6–7. Radical leaves oblong, subentire, cauline very undulate and spinose-lobate, rarely all subentire. III. i. About San Roque, especially north of it! ii. About Railway near Algeciras!

E. dilatatum L. Dry heaths and fields; frequent or common; 6–8. Radical leaves subpalmately bipinnatisect, lobes lanceolate, incised-spinose, petiole winged and spiny to base, cauline pinnatifid with broadly linear segments. III.!

Scandix Pecten-Veneris L. Dry cultivated fields and rough ground; frequent; 2–5. I. Levant! Near O'Hara's and Breakneck! III. i. San Roque, especially north! Near First Pine Wood! ii. Algeciras Station! El Saladillo! Near Sandy Bay!

Conopodium capillifolium Boiss. Dry heathy places; locally common; 6–7. Near *C. denudatum* Koch, but leaf segments longer and narrower, fruit and involucel longer. In my 2079 the involucel is abnormally long, often much exceeding fruit. III. i. By Second Pine Wood! ii. Slopes beyond Waterfall!

Ammi majus L. Dry fields and roadsides; frequent; 5–7. Varies much in height and leaf cutting, from 1–2 to 6 ft., flowers very white, involucre pinnatisect. III. i. About San Roque!

ii. About Algeciras, but rare south of it! iii. Near Los Barrios Station and elsewhere!

Var. *glaucifolium* G. & G. Stem whitish, leaves bipinnate, glaucous segments linear, entire, pedicels and involucels shorter. III. ii. Near Algeciras, *Rev.*

A. Visnaga Lamk. Cultivated fields; locally abundant; 6–7. Leaves more numerous, very finely divided. III. i. Between San Roque and S. Lorca! Road to Malaga Gardens! Near First Venta! Almendral! River above Almoraima! iii. A single plant by First River Ferry!

Apium graveolens L. Marshy places; rare; 6–9. I. or II. *K.*, either on North Front or Neutral Ground. III. i. Almoraima Soto! iii. Salt Pans! Guadacorte Marshes!

Helosciadium nodiflorum Koch. Streams and ditches; common; 4–7. Very variable; stout, erect, 3–4 ft., or small, decumbent. II.! III.!

Var. *ochreatum* DC. is a very dwarf creeping form. II. *D.* I have only seen decumbent forms of type here, much larger than var. III. i. Mouth of Guadarranque, *D.* Over Pindalista!

Pimpinella villosa Schousb. Dry bushy or sandy ground; rather locally frequent; 7–9. About 1 ft. high, much branched, leafless above, branches deflexed in bud, radical leaves rosetted, bipinnate, with rather large segments, pedicels and petals very villous. III. i. On and below Cork Wood Crags! iii. A single plant at Palmones Village!

Ridolfia segetum Moris. Cornfields; very common; 4–5. Tall, annual, leaf segments capillary, flowers yellow. [I. A casual on Europa Glacis!] III.!

†*Petroselinum peregrinum* Lag. Rough stony places; rather rare; 4–5. Tall, leafy, flowers greenish yellow, leaf segments broad, fruit laterally compressed, involucre 1–3, involucel several. I. Catchment below Rock Gun! Buffadero Gate! III. ii. Algeciras, *Fritze.*

Bupleurum protractum Hoffm. & Link. Cultivated fields; frequent; 4–6. I. North Front, *Frere.* III. i. San Roque, especially north! River bed above Almoraima! Queen of Spain's Chair! ii.!

B. paniculatum Brot. Dry heathy and bushy places; locally frequent; 6–7. Much branched, very slender, leaves long, narrow lanceolate. III. i. First Pine Wood! Cork Wood Crags and below!

†*B. foliosum* Salzm. Stony slopes and rocks on mountains; locally common; 7–8. Stout, simple, leaves close set, lanceolate, longly acuminate, panicle branched. III. ii. Mountains!

B. gibraltaricum L. Rocky places; rare; 6–8. 2–3 ft. high, leaves mostly radical, twisted so that faces are vertical, involucre and involucel persistent. I. *Lem.*! Above St. George's Hall, and towards Europa, *Webb, Boiss.* A specimen so named from Kelaart is *B. fruticosum.*

B. fruticosum L. Similar places; locally frequent; 6–8 Shrub, 4–6 ft. high, leaves scattered, elliptical lanceolate, in-

volucres very deciduous. I. Signal Station to Breakneck Battery! Between Ince's and Signal Station! Buena Vista Gorge! Near Farringdon's!

Crithmum maritimum L. Maritime rocks; locally common; 6–10. Perez Lara says it is common all round the coast. I have not seen it off the Rock. I. All round, chiefly at Europa!

Kundmannia sicula DC. Rough and grassy hills; common, locally abundant; 5–6. Short, with radical rosettes of pinnate leaves, segments broad, flowers yellow, involucres many, reflexed. I. About Willis's! Engineer Road! III.!

Œnanthe fistulosa L. Marshes; locally abundant; 4–6. Stems soft, flexible, fistular. III. iii. Guadacorte Marshes!

Œ. globosa L. var. *elata* P. L. Damp hollows and by streams; common; 4–6. Fruit much inflated, in a subglobose head. The type is 6–12 in. high, with 5–6 rays, only 2–3 fertile; it is not recorded. Var. *elata* is taller, 3½ ft. high, rays 8–15, all fertile. II.! III. i. and ii.!

†Var. *Kunzei* Lge. is intermediate in height, with 8–10 rays (the outer barren?), and pedicels thick even in flower. It is the only form hitherto recorded for our region. III. i. Between Gibraltar and San Roque, *Wk.*, *K.*, *D.* ii. Algeciras, *Rev.*

Œ. peucedanifolia Poll. Damp marshy places, often in clumps of *Juncus*; locally common; 6–8. Leaves all subsimilar, root fibres ovoid, or at least thickened. III. ii. Estuary near Reina Cristina Hotel! iii. Guadarranque Marshes!

Œ. pimpinelloides L. Dry places, chiefly in woods; very common; 4–6. Segments of radical leaves much broader than those of stem; root fibres with an ovoid or subglobose tuber near end. I. *K.* III.!

Œ. crocata L. By running water; locally frequent; 4–6. [II.? *D.* Surely *Œ. globosa* has been mistaken for it?] III. i. Queen of Spain's Chair! ii. Mountains!

Var. *apiifolia* P. L. has a colourless, not ochreous, root juice, and is usually regarded as synonymous. III. i. Between Gibraltar and San Roque, *Wk.*

Fœniculum officinale All. (*Anethum Fœniculum* L.). Dry hill slopes and banks; rare? 6–8. Perez Lara says it is as common in the province as next, but all I have seen is referable to *F. piperitum*. I. *K.*, *D.* III. ii. Algeciras, *Rev.*

F. piperitum DC. Similar places; very common; 6–10. Differs chiefly in its long narrow panicle of sublateral umbels, with much fewer rays, and fewer leaves with shorter segments. I.! III.!

Magydaris panacina DC. Dry slopes; locally frequent; 6–7. Tall, white-flowered, leaves all radical, with few very large segments, inflorescence and fruit pubescent. I. From Ince's to Signal Station! Near Michael's Cave! III. i. First Pine Wood! Alcadeza Crags! Cork Woods! ii. Waterfall Valley! Carnero Hills!

Torilis nodosa Gaertn. Roadsides, and waste places; common; 4–5. I.! III.!

T. neglecta Roem. & Schult. Ditches and hedgebanks; very common; 4–6. Near *T. infesta* Hoffm., of which some consider it a variety, but much taller, branched above only, with habit of *T. Anthriscus* Gmel. *T. purpurea* Guss. is a form with purple stem and fruit spines. I.! III.!

Caucalis leptophylla L. Bushy ground and cultivated fields; rare? 3–6. Annual, short, much branched, umbels small on short sublateral peduncles, fruit linear oblong, with long spines. I. About the middle part of the Rock, *K.*, *Boiss.*, *&c.* III. ii. Algeciras, *Rev.* A single plant by railway near aqueduct!

Orlaya platycarpos Koch. Sea sand; rare; 4–5. Annual, suberect, glabrous, involucres broad, hyaline, flowers white, broadly radiant. I.? *K.* Probably Neutral Ground. II. *K.*, *D.* III. iii. East end of Bay, near the Guadarranque, *K.*, *D.*

O. maritima Koch. Sea sand; common; 4–5. Dwarf, pubescent, involucre narrow, herbaceous, flowers small, pink, hardly radiant. I. Catalan Bay! North Front! II.! III.!

Daucus crinitus Desf. Grassy or sandy fields and hill slopes; rare; 6–7. Leaves glabrous, segments verticillate. I. *Pourr.* III. i. Campamento Common! Not in flower. ii. About Algeciras, *Rev.*

D. Carota L. Grassy or rough hills and banks; common; 4–7. Most variable; umbels flattish in flower, concave in fruit, spines distinct, short or long. *D. maritimus* Lamk., smaller and more slender, with thicker glabrous, shining leaves, and *D. maximus* Desf., taller and stouter, with large broad leaves, and larger flowers but smaller fruit, are reduced to varieties by Perez Lara. I.! II.! III.! My 1236 from railway near Algeciras may be *D. maximus*.

D. gummifer Lamk.? Rough places near sea; locally frequent? 5–8. Umbel convex in flower and fruit, branches divaricate, leaves thicker, peduncles stout, fruit spines short, confluent at base into a wing. The Gibraltar plant agrees except in fruit, which does not differ from that of *D. Carota*. *D. gingidium* L. is not synonymous, as Kelaart and Debeaux say; it has a concave umbel and different habit. I. Governor's Cottage! Mediterranean Steps!

D. muricatus L. Field borders and roadsides; very common; 4–6. Flowers large, very white, fruit with long slender spines. II.! III.!

Elæoselinum fœtidum Boiss. Sandy flats and mountain slopes; common; 5–6. Tall, flowers yellow, leaves much divided, petioles hispid, involucre 0–1, involucel several, fruit dorsally compressed, with a broad wing, which, as in *Thapsia*, is not developed till maturity. I.! III.!

E. Asclepium Bert. (*E. meoides* Koch., *E. tenuifolia* Lge.). Heaths; rather rare; 6–7. Rather tall, slender, involucres 3–4, rays long, 8–12, leaves palmately divided, two lowest lobes short and directed downwards, each lobe rather narrow, tripinnatisect, ultimate segments rather short, narrow and apiculate. III. i. Northern slopes of Chair!

Thapsia villosa L. Bushy mountain slopes; locally common;

4–7. Much like *Elæoselinum fœtidum*, but no involucres, leaves adpressed to ground, with fewer, broader blunter segments. The type has bi- or tripinnatisect leaves, segments short and rather small. I.! III. Mountains!

Var. *latifolia* Boiss. differs greatly in much larger, broader, and fewer leaf segments. III. i. Near Almoraima Station, &c.! Alcadeza Crags! ii. In and about Palmones Pinar!

T. garganica L. var. *decussata* DC. Sandy and bushy places; rather frequent; 4–8. Leaves very pilose, decussately pinnate, segments broad, decurrent, not all in one plane. I.? Dry hills at Gibraltar, *Née*. Probably in Spain, not on the Rock. III.!

Bifora testiculata Spreng. Cornfields; rare; 4–5. Fruit didymous, very rugose. Not synonymous with *Coriandrum sativum* L. as Debeaux makes it. III. Between Gibraltar and Algeciras, *D.* i. San Roque, Campamento, &c., *Frere*.

Capnophyllum peregrinum Lamk. Cornfields; very common; 4–5. Annual, very glaucous, divaricately branched above, umbels subsessile, flowers small, white, fruit transversely plicate. III. i. and ii.!

Ferula communis L.? Dry bushy slopes; rare or error? 3–5. Leaves flaccid, ultimate segments long, narrow linear, entire. I think the next species may have been mistaken for this, though the record is by Lemann, who is usually accurate. I.? *Lem.*

†*F. tingitana* L. Similar places; locally very common; 3–5. The stoutest and earliest yellow umbellifer, leaves very large, much dissected, subcoriaceous, very shining, ultimate segments oval and lobed, fruit oval, with a thick border. I.! III.? Near Gibraltar, *Fritze, Winkl.* This may refer to the Rock itself, I never saw it elsewhere.

Opoponax Chironium Koch. Rough places; rare; 5–6. Rather like *Kundmannia sicula*, but much larger and more branched, pubescent, rays 20–30, involucres few, fruit dorsally flattened, ribs keeled, margin thick, obtuse. III. ii. Near Algeciras, *Winkl.*

Hippomarathrum Pterochlænum Boiss. Sand-dunes; locally abundant; 5–6. II.! III.!

H. Bocconi Boiss. Similar places; rare; 5–6. Half the size, fruit smaller, with smooth, not papillose ribs, all involucres entire. Smooth fruits are by no means always associated with entire involucres, they are much divided in Ball's specimen. II. *Ball*! III. ii. Near Algeciras, *Winkl.*

Smyrnium Olusatrum L. Waste and bushy places; abundant on Rock, occasional in Spain. I.! III. i. Malaga Gardens! iii. About Guadacorte!

Conium maculatum L. Waste places and field borders; rare; 5–6. I. Burial Ground, *K.* This may be North Front or Sandpits. A single plant on North Front! III. i. By river at Almoraima! ii. Carnero Hills!

Araliaceæ.

Hedera Helix L. Rocks and walls, but chiefly in woods; locally common; 9–1. I. In gardens or on buildings, but native in many places! III. i. and ii. Abundant in mountains, rare elsewhere!?

Caprifoliaceæ.

Lonicera implexa Ait. (*L. Caprifolium* Desf.). Bushy mountain slopes; common on Rock, occasional in Spain; 5–6. I.! III. i. Queen of Spain's Chair! Alcadeza Crags! Malaga Gardens! Cork Woods!

Var. *puberula* P. L. Leaves pubescent beneath, corolla glandular, villous or glabrous. III. ii. Slopes beyond Waterfall!

L. Periclymenum L. Woods and bushy places; occasional; 5–7. Perhaps more frequent than my stations show. [I. Introduced, *K.*]

Var. *hispanica* Ball. Leaves softly pubescent both sides, pedicels, calyx and corolla densely glandular. III. i. Cork Woods! ii. S. de Palma, *Rev.* iii. Guadacorte Marshes!

Sambucus nigra L. Woods and near cottages; occasional; 4–6. [I. In hedges and gardens, *K.*] III. i. Cork Wood Sotos! Above Almoraima! About San Roque and towards Station! ii. By Miel, &c., about Algeciras! El Cobre! M. de la Torre!

S. Ebulus L. Waste places near habitations; rare; 6–7. III. ii. Above Miel Bridge! Below Palmones new bridge!

Viburnum Tinus L. Woods; locally frequent; 3–4. III. i. Queen of Spain's Chair, leaves only!? Cork Woods! ii. Upper mountain slopes!

Rubiaceæ.

Sherardia arvensis L. Grassy places, fields and woods; abundant; 2–6. I.! II.! III.! With pure white flowers near Algeciras!

Asperula arvensis L. Cornfields and open places; rare; 4–5. Annual, flowers deep blue, involucred by glabrous leaves. III. i. Long Stables! Slopes of San Roque, *D.* ii. South of Algeciras!

A. hirsuta Desf. Stony slopes and fields; rare; 4–5. Perennial, flowers rose, panicle leaves much shorter, glabrous. I. *K.* III. i. Slopes of San Roque, *D.* Pinar del Rey, *Porta & Rigo*!

Crucianella maritima L. Sand-dunes; rather frequent; 4–7. Perennial, rigid, scabrous, leaves pungent, short, broad, decussate, flowers yellowish in broad bracteate spikes. I. Catalan Bay! II. *K.*, *D.* III. i. Near Tunares! ii. Palmones Playazo! Sandy Bay! iii. Palmones Sands!

C. angustifolia L. Dry waste places; rare; 5–6. Annual, slender, divaricately branched, leaves short, adpressed, spikes slender. III. i. By Fort San Felipe, *D.* Slopes of San Roque, *D.* ii. Railway near Algeciras!

Rubia peregrina L. Bushy places; very common; 4–6. The type has leaves broadly lanceolate, acuminate. I.! III.!

Var. *latifolia* G. & G. (var. *lucida* Webb). Leaves ovate or obovate-elliptical, shortly and abruptly acuminate. I. *Juss.*, *K.*, *D.* III. i. Slopes of San Roque, *Boiss.* Alcadeza Crags! ii. Mountains, with leaves up to ¾ in. wide!

Var. *angustifolia* G. & G. Leaves linear lanceolate, gradually acuminate. I. *Juss.*, *K.*, *D.* III. i. San Roque, *ib.* ii. Mountains, the commoner form! A very peculiar state (my no. 2241) grows in Palmones Sands, doubtless induced by exposure and absence

of material on which to climb. It is dwarf, erect, compact, and little scabrous.

[*Galium gibraltaricum* Schott fil. A doubtful species, described in Deb. Fl. p. 95. Perez Lara thinks it may have been a form of *G. campestre*.]

G. ellipticum Willd. Shady valleys and mountain slopes; locally frequent; 5–6. III. i. Woods near San Roque, *Pourr.* Almoraima, *Reut.* ii. Mountains!

[*G. rubioides* L. Kelaart was informed that this grew in Gibraltar, but it has not been confirmed.]

G. palustre L. var. *elongatum* G. & G. Marshes and ditches; occasional or locally frequent; 5–7. III. i. Cork Wood Sotos! Lajo Marshes! ii. Shore marshes near Algeciras, *Rev.* iii. Guadacorte Marshes!

G. campestre Schousb. Cultivated and fallow fields; frequent; 5–6. I. *P. L.* III. i. Campamento Common! Alcadeza Crags! Around San Roque! ii. Carnero and Algeciras Hills! iii. Salt Pans!

[*G. viscosum* Vahl. (*G. glomeratum* Desf.) is recorded by Kelaart from the Spanish Racecourse, doubtless in error for the last.]

G. divaricatum Lamk. Dry grassy or stony places; rare; 5–6. Very near next, but panicle broader, laxer, branches elongate and filiform, leaves not reflexed. I. *Pavon.* III. i. San Roque, *Reut.*, *D.* ii. Algeciras, *Rev.* Upper Waterfall Valley!? Perhaps *G. parisiense.*

G. parisiense L. (*G. anglicum* Huds.). Similar places; rather rare; 5–6. III. ii. Algeciras Station! Between El Cobre and El Saladillo!

Var. *vestitum* G. & G. has a hispid fruit. III. i. Campo Common! Railside beyond San Roque! ii. Railside beyond Algeciras!

G. Aparine L. Roadsides, gardens and hedges; frequent; 3–5. I. Chiefly in gardens! Reclamation Road! III.!

G. tricorne With. Cornfields; rare? 4–5. I. *K.* III. i. Near Pindalista! Almoraima!

G. saccharatum All. Dry hills, banks, walls, &c.; very abundant; 1–4. Large specimens not in fruit resemble *G. Aparine.* I.! III.!

G. murale All. Walls, rocks and dry places; very common; 1–5. I.! III. i. and ii.!

Vaillantia hispida L. Rocks and old walls; rare? 4–5. Hispid, inflorescence dense, no horn on top of fruit. I. Near Levant Battery!

†*V. muralis* L. Similar places; locally very common; 2–5. I.! Sometimes slightly hispid. My 300, from Catalan Bay, is a very laxly branched form simulating *Polycarpon tetryphyllum.*

Valerianeæ.

Valeriana tuberosa L.? Stony or grassy places; rare or error? 4–5. Forms of this often resemble *C. Calcitrapa*, which Kelaart may have mistaken for it. I. South and west slopes, *K.*

**Centranthus ruber* DC. Rocky places, probably not native, but quite naturalised; 4–6. I. Above Devil's Gap, flowers usually white! Parson's Lodge!

C. Calcitrapa DC. Rocks, old walls and stony places; frequent? 4–6. Very near next, but usually shorter and more slender, cymes more compact, and corolla tube only as long as achene. I. About Willis's! III. i. Cork Wood Crags! ii. Palmones Playazo! I think it occurs in many other places, but I had difficulty in distinguishing it from next.

C. macrosiphon Boiss. Similar places, and in deep sand; much commoner; 3–7. Usually much stouter, corolla tube 3 times as long as achene. I.! III.!

Fedia Langei Pom. Cultivated fields, &c.; abundant; 1–5. Known from next by oblong-linear fruit. The relative lengths of corolla tube are not reliable, and the species are indistinguishable in flower. I believe both are equally common I.! II.! III.!

F. graciliflora Fisch. & Mey. (*F. Cornucopiæ* Gaertn.?). Similar places; abundant; 1–5. Fruit suborbicular, more or less inflated. Perez Lara gives the synonymy cited, but Pomel shows that there are differences (*Vide* Deb. Fl. pp. 98–99). I.! III.!

Valerianella microcarpa Lois. Dry fields and grassy places; rather rare; 2–4. A slender annual, fruit the smallest of our species, less than $\frac{1}{2}$ line long, calyx limb very small, obtuse. III. i. Path above Bonel's Farm! West slopes of Queen of Spain's Chair! Cork Woods!

V. truncata Betcke. Similar places; rare; 3–5. Shorter than last, corymb closer, fruit rather larger, calyx limb reticulate, apiculate, as long and as broad as fruit. III. i. Riverside above Almoraima!

†*V. carinata* Lois. Similar places; rare; 3–5. Flowers in dense globose heads, fruit $1\frac{3}{4}$ by $1\frac{1}{4}$ lines, prominently ribbed, crown hardly distinct from body. III. i. By Soto Gordo!

V. coronata DC. Sandy cultivated or fallow fields; rare; 4–5. A stout annual, very like next, but calyx campanulate, glabrous within. Kelaart wrongly makes them synonymous. III. i. Near San Roque, *Wk.* ii. Near Algeciras, *Rev.*

V. discoidea Lois. Similar places; frequent; 4–5. Calyx subrotate, tomentose within. I. Moorish Wall! Near Michael's! Engineer Road! III. i. Near Campamento Cemetery! San Roque, especially on north side! Cork Wood Crags! ii. Near Algeciras Cemetery! iii. Near Guadacorte!

Dipsaceæ.

Dipsacus sylvestris Mill. Damp grassy places; common; 6–7. Central scales of inflorescence often long, forming a coma as in *D. ferox*. III.!

†*Cephalaria syriaca* Schrad. Dry fields; rare, probably casual; 6–7. Annual, 6–18 in. high, heads small non-radiant, pale blue or lilac, pales and involucre longly mucronate. III. i. San Roque, *K*. Perez Lara wrongly cites the station as Gibraltar.

Pterocephalus Broussonetii Coult. Dry bushy hills and sandy places; frequent; 5–6. Tall, with smaller blue heads than either of the *Scabiosæ*. II. *Deb.* III. i. Cork Woods! Alcadeza and elsewhere! ii. M. de la Torre! Hills north of Algeciras! iii. Near Los Barrios Station! About Salt Pans!

Scabiosa maritima L. var. *grandiflora* Boiss. Dry hills and bushy places; very common; 5–6. The type, not recorded, has heads of medium size, corolla lilac rose, or yellowish, ovate-cylindrical in fruit. Var. *grandiflora* has flowers and heads twice the size, cylindro-conical in fruit, lower leaves serrate, not deeply incised. I.! III.!

Var. *atropurpurea* Boiss. Flowers dark or blackish purple. The flowers vary in shade, but I have never seen any approaching the *atropurpurea* of horticulturists. I. Rare, *K.* III. ii. Sands at Algeciras, *Nilss.*

S. stellata L. Similar places; rather common, especially in III. ii.; 5–7. I. Rare? III. i. By Lajo! Alcadeza Crags, &c.! ii.! iii. Occasional!

Pycnocomon rutæfolium Hoffm. & Link. var. *bæticum* Lge. (*Scab. urceolata* Desf. var. *bipinnatisecta* Boiss.). Sand-dunes; very common; 5–8. The variety is taller, 2–4 ft., heads twice the size and more radiant, and phyllaries connate to one-third, instead of half their length. II.! III.!

Compositæ.

Eupatorium cannabinum L. Marshy ground; locally frequent; 6–8. III. i. Cork Wood Sotos!

Bellis annua L. Open grassy places; abundant; 12–5. Small simple forms are var. *minuta* DC. A form with lavender, not at all pink or red ray florets, is abundant on Neutral Ground and by Devil's Tower. I. Behind the Grand Stand and by Devil's Tower! *Débris* at foot of Forts, *K.* II.! III.!

B. perennis L. Similar place; rare? 2–5. Closely resembles small states of *B. sylvestris*, but its disc achenes are glabrous on the edge, not ciliate. The faces in both are puberulous. I.? *K.* III. i. Cork Woods near Almoraima!

B. sylvestris Cyr. Open fields and woods; rare on Rock, abundant in Spain; 11–5. I. Top of Mediterranean Steps and towards Breakneck Battery! Above oil tanks beyond Catalan Bay! III.! Grows 18 in. high in the mountains!

Var. *pappulosa* Lge. Achenes with a short setose pappus, is said to be commoner in the province than type. I. Ravines on west slopes, *K.*, *D.* III. i. South slopes of San Roque, *Boiss*, *D.* ii. S. de Palma, *Rev.*

†*B. rotundifolia* B. & R. Woods and higher mountain slopes; locally very common; 1–5. Willkomm and Lange and Perez Lara state that only var. *hispanica* Wk. is found in Spain. It is stoloniferous and has a much longer pappus. I have dug up dozens of plants and never saw a trace of a stolon, nor is the pappus long. The leaves vary from deeply reniform to truncate, and at lower elevations, where it overlaps *B. sylvestris*, they are

somewhat narrowed below. I suspect the two hybridise. III. i. Queen of Spain's Chair! ii. Mountains!

Conyza ambigua DC. Waste places, roadsides and gardens; frequent; 5–11. I.! III.!

Aster longicaulis Duf. Marshes near sea; locally rather frequent; 9–11. III. ii. Palmones Playazo! iii. Salt Pans!

Pulicaria arabica Cass. var. *hispanica* Boiss. Damp and waste places; ditches and watercourses; frequent; 5–9. The type is not found. A dwarf form is frequent, as at Palmones Village. I. A few plants at waterworks on Willis's Road! II.! III.!

Var. *perennans* P. L. is biennial or perennant, stouter, branches shorter, subpaniculate, leaves very long, and is, I think, frequent. III. i. Railside near San Roque Station, and elsewhere!

P. dysenterica Gaertn. †var. *hispanica* Wk. Marshes; locally frequent; 7–9. The variety is puberulous, not woolly, leaves flat, cordate, not undulate and acutely auricled. Often 3–4 ft. high. III. i. Cork Wood Sotos! ii. Algeciras, *Rev.* iii. Guadacorte Marshes! Salt Pans!

P. odora Reichb. Heaths and sandy plains, and in woods; very common; 5–6. III.!

Inula viscosa Ait. Rough stony ravines and watercourses; frequent; 7–11. I.! II.! III.!

†Var. *laxiflora* Boiss. has heads longly peduncled and distant, in a lax panicle, and occurs frequently with the type. I.! III.!

I. crithmoides L. Tidal rivers; locally common; 9–10. III. ii. and iii. Palmones River, both sides! Aguacorte River! Palmones Playazo! Salt Pans!

Asteriscus maritimus Moench. Dry rocky places; locally abundant; 1–12, but chiefly 3–6. Varies much in size and habit. Erect specimens look very like *A. aquaticus*, but it is perennial, with the central head peduncled. I.! III. i.? Slopes of San Roque, *K.*, *D.* I strongly suspect that *A. aquaticus* has been mistaken for it here. ii. Carnero Point!

†*A. brachiatus* Jord. & Fourr. Similar places; rare? 3–6. III. i. Algeciras, *Rev.* Probably at Carnero Point, whence my specimens do not differ appreciably from last, of which this may be only a slight variety.

A. aquaticus Moench. Dry fields; common; 5–6. Annual, like *A. spinosus*, but with more divaricate branches; soft involucre tips, and central head closely sessile. III. i. Carteian Hills! North of San Roque! ii. Hills round Algeciras! Carnero Hills! iii. Palmones Village!

A. spinosus G. & G. Dry hills and bushy places; common; 4–6. I.! III.!

Var. *aureus* Wk. Rays much wider. III. ii. As common as type near Algeciras, but not seen elsewhere!

Perideræa fuscata Webb. Cultivated and fallow fields, and roadsides; very common, 12-6. Pales between florets, tube of latter flattened and winged, prolonged into a cap over achene. I. Near Inundation, *K.* Not there now I think. II.! III.!

†*Anthemis arvensis* L. Sandy and gravelly heaths; occasional

or frequent; 3–6. Pales of receptacle becoming conspicuous as flowers fade, tube of florets not prolonged, achenes ribbed, not tuberculate. Much resembles *Ormenis mixta*. The type and variety run into one another, but Perez Lara records var. only. I. *K.* II.! III. i. Bonel's Farm! ii. Palmones Pinar!

Var. *incrassata* Boiss. Peduncles greatly thickened after flowering, almost tubiform. III. i. Pinar de los Bigotes! iii. Palmones Marshes!

A. Cotula L. Similar places; occasional, or here and there abundant; 5–7. Aromatic, leaf segments capillary, pales not conspicuous, narrow, achenes tuberculate. III. i.! ii. El Cobre!

A. maritima L. Sand-dunes; locally plentiful; 5–7. Perennial, in dense tufts, leaf segments thick, deeply punctate. I.? *K.* II. *K.*, *D.* Probably not also in I. III. i. Hedge at Bonel's Farm, an abnormal drawn up form! ii. and iii. Mouth of Palmones River, both sides! "Mountains above Algeciras," *B. & R.*! An unlikely station, probably the shore is meant.

Ormenis mixta DC. Sandy heaths, &c.; abundant; 5–9. Annual, prostrate and rooting, or suberect and tall, leaves narrow spathulate, terminal pinnæ the longest, pales folded over achenes, tube of disc florets expanded and spurred at base. II.! III.!

Achillea Ageratum L. Dry places in rather stiff soil; occasional; 5–10. Rigid, erect, heads yellow, small, in a compact corymb. III. i. Alcadeza! Magazine Hill! Malaga Gardens! Second Venta! By upper ford over Lajo! &c. iii. Near Los Barrios Station! Guadacorte!

Diotis maritima Sm. Sand-dunes; locally common; 6–7. II.! III. ii. Sandy Bay! Beyond Carnero Point!

Anacyclus radiatus Lois. Fields, roadsides and waste places; very common; 4–6. Usually tall and stout, sometimes prostrate, two outer lobes of disc florets much larger. I.! II.! III.!

†Var. *purpurascens* DC. has ray florets red on back. I. Less common than type, *K.* III. i Noted, but no stations recorded! ii. Algeciras, much rarer than type, *K.*, *D.*

A. clavatus Pers. Similar places; rare? 4–6. Ray white, shorter, phyllaries without a broad appendage. II. Two specimens, one rayless! III. ii. Palmones Pinar! Algeciras Station!? iii. Hills near Los Barrios Station!

[*Cladanthus arabicus* Cass. (*C. prolifera* DC.), a yellow-rayed annual, with long proliferous branches from below the central head, and leaves with linear segments, is recorded from Gibraltar by Kelaart only.]

Matricaria glabra Lag. Fallow fields and waste ground; very common; 4–5. No pales between florets, achenes curved, with auriculate pappus, ray achenes connate with involucre, leaf segments linear, not setaceous. I. Above Willis's! II.! III.!

[*M. discoidea* DC. (*M. suaveolens* Buch.), a roadside casual near Algeciras bull-ring.]

Prolongoa pseudanthemis Kunze. Sandy heaths; locally common; 3–4. A small annual, leaves pectinipartite with short

entire lobes, peduncles very long, ray white, becoming carmine. III. i. By Second Pine Wood!

Chrysanthemum segetum L. Cornfields; common; 4–5. Leaves, at least lower, trifid, lobes deeply incised. I. Abundantly in gardens, *K.* III.!

Pinardia coronaria Less. Roadsides, banks and fields; very common; 3–6. Ray pale yellow, or deep yellow towards base, or wholly deep yellow, the latter the rarest. I.! II.! III.!

†*P. anisocephala* Cass. Sand-dunes; locally abundant; 4–6. Tall, glandular viscid, with entire or toothed leaves. III. ii. and iii. Guadacorte and Palmones Sands, both sides of River! "Mountains above Algeciras," *B. & R.*, doubtless a misuse of collectors' printed labels.

†*Coleostephus Myconis* B. & R. Sandy fields; rare, but perhaps mistaken for *Chrysanthemum segetum*; 3–5. A glabrous yellow-rayed annual, leaves acutely serrate, achenes with a tubular crown. I. Sandy fields, *K.* III. ii. Near shore at Algeciras, *B. & R.*

**Artemisia pontica* L. Fields; frequent; 7–10. Ashy green, herbaceous, 12–18 in. high, leaves short, bipinnatifid, segments linear, heads small, hemispherical, bright yellow. I have only seen very late specimens, and have not collected it. I think much more general than my notes show. [I. A doubtful native, *D.*] III. i. Carteian Hills, especially near Francia's Farm! iii. About Los Barrios Station!

†*Helichrysum rupestre* DC. var. *Boissieri* Wk. (*H. Fontanesii* Camb.). Rocks; locally frequent; 5–6. Stems few or solitary, leaves broadly linear, corymbs and heads rather large, phyllaries glabrous. The description emphasises that all phyllaries are as long as florets; they are certainly not so in our plant, and hardly differ from those of *H. Stæchas*. The plant is said to be inodorous. I have not tested this. I. All over upper Rock, especially on precipices!

H. decumbens Camb. Rocks; rare; 5–6. Much smaller and more decumbent, leaves close set, shorter, soon reflexed, heads smaller, fewer, deeper yellow. I. *Boiss.*!

H. Stæchas DC. Rocky slopes; locally common; 5–7. Like *H. rupestre*, but strongly aromatic, much more cæspitose and many-stemmed, leaves much narrower, heads smaller, in smaller clusters, often paler yellow. III. i. Cork Wood Crags! Alcadeza Crags!

H. serotinum Boiss. (*H. angustifolium* DC.). Sand-dunes; locally frequent; 7–9. Densely cæspitose, many-stemmed, leaves very narrow, anthodes smaller and more cylindrical than in other species, outer phyllaries woolly on back. Leaves canescent or quite green. III. ii. and iii. About Palmones, on both sides of River!

Gnaphalium luteo-album L. Sandy places; occasional; 3–8. I. North Front, near Catalan Bay, *D.* III. i. Along the Lajo! Almoraima! Alcadeza! ii.! iii. Salt Pans!

Filago germanica L. Fields and waste places; rare? 5–6.

Erect, branched above only, branches ascending, leaves narrow, acute, not overtopping heads, heads 20–40 in cluster, obscurely angled. I. Rare, *K.*

†*F. apiculata* G. E. Sm. Similar places; frequent? 5–6. Upper leaves obtuse, apiculate, heads fewer in clusters, deeply 5-angled. Very near last and next, perhaps confounded with either. III. i. Campamento Common!

F. spathulata Presl. Similar places; very common; 5–6. Horizontally branched from base, inflorescence proliferous, leaves broader, obtuse, undulate, heads fewer in clusters, deeply grooved.

Var. *prostrata* Wk., prostrate, and var. *erecta* Wk., erect, grow together. II. *D.* III.!

F. arvensis L. Similar places; rare? 5–7. Slender, erect, leaves linear, floral shorter than clusters, phyllaries not embracing achenes. II. *K.* III. i. Near San Roque, *Brouss.*

F. gallica L. Similar places; very common; 5–6. Floral leaves much longer than clusters, phyllaries embracing achenes. I. South and west slopes, *K.*, *D.* III. i. and ii.!

Phagnalon saxatile Cass. Dry rocky places, walls and sand-dunes; frequent, abundant on Rock; 3–6. I.! III. i. Campamento Common! Carteia! Cork Wood Crags, &c.! ii. Near El Cobre! Palmones Playazo! Carnero Point! iii. Guadacorte!

Evax asterisciflora Pers. Dry sandy soil; rare? 4–6. Involucrating leaves acute, pales of receptacle cuspidate, anther tails short, dentate. III. ii. Algeciras, *Winkl.*! The specimen looks to me more like next.

E. pygmæa Pers. Similar places; common; 4–6. Very like last, but smaller, involucral leaves obtuse, pales acute, anther tails linear, entire. III. i. River bed at Almoraima! iii. Gardens at Salt Pans! This or the last grows in many other places, but I did not learn to distinguish them.

†*E. Cavanillesii* Rouy. I know nothing of this beyond Debeaux's note in Fl. p. 107. III. ii. Dry sandy hills at Algeciras, *Rev.*

Senecio Lopezii Boiss. Woods; locally frequent; 4–5. A tall handsome species, leaves large, undivided, heads large, corymbose.

†Var. *minor* Wk. (*S. gibraltaricus* Rouy), the only form recorded, seems indistinguishable from type. III. i. Cork Woods! ii. Neck above Pelayo, and slopes of El Frayle Ridge! Summit of S. de Palma, *Rev.*

**S. Cineraria* DC. is quite naturalised about Europa Glacis and Flats and by Governor's Cottage!

S. foliosus Salzm. Damp grassy places, and by watercourses; frequent? 6–10. Near *S. Jacobæa* L., but shorter, and inflorescence laxer. Its late flowering gave me little opportunity of distinguishing it from *S. erraticus*. I. Catchment below Rock Gun! A specimen or two below Breakneck Battery! Above Main Road near Alameda (*K.*, as *S. Jacobæa*). II.! Varying in leaf cutting, perhaps both species occur. III.!

†Var. *suffrutescens* Wk. is woody at base, leaves thicker, sub-

fleshy, peduncles stouter, bracts more numerous. I. Western slopes, *Wk.*

S. erraticus Bertol. Similar places; common? 6-10. Near *S. aquaticus* Huds., but with lax paniculate, not corymbose inflorescence, leaves much less divided than in last. II.!? III. i. and ii.!

S. gallicus Chaix. Sand-dunes and light soil; locally common; 1–5. A rayed annual, inflorescence corymbose, leaves all pinnatisect. The type (var. *laxiflorus* DC.) has an external calycule of short phyllaries. I. At and beyond Governor's Cottage!

Var. *exsquameus* DC. has no calycule. III. i. and iii. Sand-dunes at Linea and Palmones! Dautez says type and var. are indiscriminately mixed. I have found type only on the Rock, and only var. in Spain.

S. petræus B. & R.? Rocky slopes rare; 4–6. Annual, stout, rather tall, stem leaves entire, broadly amplexicaul, upper sometimes inciso-dentate, anthodes few and large. I.? *Dasoi.* This collector's records are not reliable.

†*S. leucanthemifolius* Poir. Sandy places; rare; 3–4. A low annual, often much branched, leaves inciso-dentate, not lobed, corymb few-headed, heads larger than those of *S. gallicus.* I. Sandy grassy places on west side of Rock, *D.*

S. minutus DC. †var. *gibraltaricus* Wk. Shady rocky places; rare; 5–6. Heads few, rather large, on long subradical peduncles, radical leaves dentate, cauline simply pinnate, lobes linear, sometimes dentate. I. *Lem.*! Both sides of Rock, *Wk.*, *Boiss.*, *&c.* Kelaart indicates the Governor's Cottage as its habitat, where I have repeatedly searched in vain for it.

S. lividus L. var. *major* G. & G. Shady bushy ground; rather rare; 2–6. I. *Lem.*! East slopes, *Wk.*, *D.* III. i. Summit of Chair! Cork Woods! ii. Railside near Algeciras! Waterfall!

S. vulgaris L. Fields, roadsides and waste places; very common; 1–12, but chiefly 12–3. I.! II.! III.! Reaches highest summits!

Calendula arvensis L. Open sandy, stony and grassy places, rarely in mountains or woods; abundant; 11–5. Strictly annual, often subsimple and low, sometimes branched and straggling, like next. Outer fruits erect or incurved, lateral wings broad, spines on back many, large, in two rows, usually a spur inside at base. It varies with deep orange flowers. I.! II.! III.! A field full of the orange-flowered form at Magazine Hill!

Var. *malacitana* P. L. Flowers half the size, ligules often not longer than phyllaries, fruit larger and more spinose. Debeaux admits the var. only, though it is much rarer than type, at least in good forms. I. Below Devil's Gap! III. Rather frequent to Carnero Point!

C. stellata Cav. Rocky and stony slopes; locally common; 3–5. Stout, much more straggling, probably always annual, but often becoming woody at base, flowers as large as next, outer fruits stellately spreading, muricate, not spiny on back, wingless or nearly so, no spur on face at base. I.! III. i. Alcadeza Crags!? Perhaps only large *C. arvensis*, I did not see fruit.

†*C. suffruticosa* Vahl. (*C. marginata* Willd.). Rocky and stony places near sea; locally frequent; 3–5. Always perennial, stouter and more woody, with large flowers, but little differing from last. The synonymy is somewhat involved. I. Maritime rocks near Landport, *D.*, *Rev.*, *Nilss.* O'Hara's Tower!

Var. *tomentosa* Ball (*C. incana* Willd.) is a very white silky form. I. Rocks on north-east slopes near Landport, *K.*, *D.* I suspect the north-west slopes are meant, where it is plentiful, and on the *débris* below! III. i. Slopes of San Roque, *D.* ii. Carnero Point!

Atractylis cancellata L. Dry hills; frequent; 5–6. I. Middle parts of Rock below Michael's Cave, *K.* Europa, *Hurst*! III. i. Opposite Francia's Farm! Carteian Hills! Near Pinar de los Bigotes! Path to First Pine Wood! ii. Beyond Carnero Point! Valley near Frayle Point!

Carlina gummifera Less. Grassy places; locally common; 8–9. III. i. From Campamento to First Pine Wood! ii. Carnero Hills!

†*C. lanata* L. Grassy and stony hills; rare; 6–8. Like next, but stems simple or branched at top, leaves broader, heads solitary, 1–1¼ in. in diameter over ray, inner phyllaries purple. III. i. South slopes of San Roque, *D.*

C. racemosa L. (*C. sulphurea* Desf.). Similar places; abundant; 7–9. II.! III.!

C. corymbosa L. Bushy and heathy places, chiefly on mountains; frequent; 6–7. Much more leafy, with larger heads, 1 in. broad. I.! III.!

Var. *involucrata* Boiss. (var. *major* Lge.) is stouter, sparingly branched at apex only, heads 1½–2 in., floral leaves longer than ray. I think frequent, but have not collected it. I. Herb. Madrid, *teste* Deb.

Kentrophyllum lanatum DC. Open fields; very common; 6–8. Much resembling *Carlina racemosa* when not in flower. Arachnoid-pubescent, leaves glandular-viscid, outer floral bracts erect patent, as long as flowers, heads 1 in. long, achenes and pappus pale. III. i. and ii.!

K. bæticum B. & R. Similar places; rare? 6–9. Stem white, leaves shining, subglabrous, the floral recurved patent, longer than heads, achenes and pappus blackish. Debeaux admits this species only, though it appears much the rarer. I. *Nilss.* III. i. Rough slopes of San Roque and S. Carbonera, *D.* Lane beyond Bonel's Farm!

†*K. arborescens* Hook. Bushy slopes; locally common; 5–6. I. Chiefly south-west, less common north-west, still rarer east slopes! III. i. Carteia, *K.*

Carduncellus cæruleus DC. Rough hills and fields; common; 4–6.

Var. *incisus* DC. has all leaves pinnatifid and spinose dentate, and is said to be commoner. My records are for the aggregate. I. Near Devil's Tower! III.! Chiefly in i.!

Onopordon Acanthium L. Waste places and roadsides; rare;

7–8. Perez Lara only gives one other station in the province, but says that *O. nervosum* Boiss., with glandular, not glabrous corolla is much more frequent. III. i. Between Neutral Ground and Guadarranque, *D.* Campamento and San Roque, *Frere.*

Bourgæa humilis Coss. Dry grassy places; very common; 5–7. Often mistaken for next. Inner phyllaries longly acuminate and spinose, like outer. An albino is rather frequent, and is doubtless the plant referred to as *Cynara alba* by Kelaart. I. Engineer Road! III.!

Cynara Cardunculus L. (*C. horrida* Sibth.). Similar places; rare or error? 5–7. Much taller, with fewer broader leaf segments and rachis, phyllaries with very stout spines, the inmost with an expanded membranous appendage. I much doubt its occurrence. [I. Boiss. ex Deb. Fl. p. 113. Boissier's label reads "between Estepona and Gibraltar"! Kelaart's specimen is *Bourgæa humilis*.] III. i. Dry hills of Campamento, *K.*? San Roque, *D.*?

Notobasis syriaca Cass. Fields; common; 5–6. II. A plant or two! III.!

[*Cirsium lanceolatum* Scop. var. *hypoleucum* DC. is recorded by Kelaart as introduced in Gibraltar. I have seen leaves of what might be this between Guadacorte and the railway bridge.]

C. giganteum Spr. Rather damp places, chiefly near streams; here and there plentiful; 6–8. Often 8–9 ft. high. III. i. First Pine Wood! Rare in Carteian Hills! Near Second Venta! Between Malaga Gardens and Alcadeza! Near Almendral, *K.* ii. Below El Cobre! Near top of Waterfall Valley! M. de la Torre! Carnero Hills!

†*Carduus myriacanthus* Salzm. Sands near sea; rare; 4–5. About 1 ft. high, like a very spiny *C. pycnocephalus*, but phyllaries much narrower, with long spinose tips. *C. Reuterianus* Boiss., which differs in no important character, is frequent in the province. II. Isthmus of Gibraltar, *Wk.*! III. i. Linea, *Porta & Rigo*! About San Roque, *Boiss.*

C. tenuiflorus Curt. Waste places and roadsides; frequent or common; 4–6. Perhaps only a variety of next, with stem winged to top, heads subsessile, densely capitate, &c. I.! III.!

C. pycnocephalus Jacq. Similar places; frequent but less so than last; 4–6. Stem interruptedly winged, naked at top, heads larger and laxer, 2–3 together, the central usually peduncled. I.! II.! III.!

†*C. nigrescens* Vill. Heathy places; rare; 4–7. Like next, but heads smaller and erect, phyllaries more glabrous, not reflexed. I. ? *Dasoi*. III. i. Path to First Pine Wood!

†*C. nutans* L. Similar places; rare; 5–7. III. ii. Near Algeciras, *Clem.*

Silybum Marianum Gaertn. Roadsides and waste places; rather frequent; here and there abundant; 4–6. I. Europa Flats! Jews' Cemetery! North Front! II.! III.!

Galactites tomentosa Moench. Dry rough fields; abundant,

often in large masses; 4-6. I. Lower and middle parts, rarely upper Rock! II.! III.!

†Var. *integrifolia* Boiss. Leaves entire or denticulate. It may be common, but I have not seen it. I. *K.*

Serratula bætica Boiss. var. *pinnatifolia* Wk. Wooded slopes; locally frequent; 6–7. Like a dwarf *Centaurea*, but phyllaries long, lanceolate, acuminate into a spine. III. i. Queen of Spain's Chair! ii. Slopes beyond Waterfall! Carnero Hills!

Leuzea conifera DC. Wooded slopes and heaths; rare; 5–6. III. i. Wooded slopes of San Roque, *D.* Alcadeza Plain!

Crupina vulgaris Cass. Stony slopes; rare; 5-6. III. i. Alcadeza Crags!

Microlonchus Clusii Spach. Roadsides and bushy banks; frequent; 4–7. I. Jews' Cemetery! Rosia Parade! III.! Grows 5 ft. high by the Miel!

Centaurea tagana Brot. Woods; locally occasional; 5–6. One of the largest of the genus, with very large heads of dingy yellow flowers. III. i. First Pine Wood! Cork Woods! ii. Upper slopes of Waterfall Valley!

†*C. alba* L. var. *deusta* DC. Dry rocky or sandy slopes; locally frequent; 6–7. Habit of *C. aspera*, but phyllaries lax, ovate, broadly hyaline, with a blackish brown central band. III. i. Alcadeza Crags! Cork Wood Crags!

†*C. sempervirens* L. Woods; rare; 6-7. Tall, much branched, leafy to apex, flowers purple, appendages shortly pectinate. III. ii. Waterfall!

†*C. uliginosa* Brot. Marshes; rare; 6–7. Subsimple, 4–6 ft., leaves very long, narrow, peduncles long, pectinæ shorter and fewer than in last, and erect or spreading, not reflexed. My specimens are taller than the description gives, and have the upper leaves quite entire, not denticulate. III. i. Almoraima Soto!

C. pullata L. Grassy and bushy places, sides of ditches, &c.; very common; 2–5. Dwarf, very leafy, flowers pink or rosy, phyllaries pale green with black edges, appendages reflexed, pectinate. Varies much in habit and leaf lobing. I.! II.! III.!

C. diluta Ait. Rough fields; rare; 5–7. Phyllaries pale, appendages white, shortly lacerate, subdecurrent, terminal 1–3 spines rigid, not longer than others, and erect. III. i. Carteian Hills, a single plant!

†*C. Seridis* L. Sandy ground; rare; 4–6. Perennial, erect, branched, woolly-canescent, leaves longly decurrent, the lower dentate, rarely lobed, heads large, florets purple, phyllaries with 7–11 remarkably long reflexed spines. III. i. Near San Roque, *Ball.*

†Var. *maritima* Lge. differs in very large lyrate-pinnatifid leaves, the cauline less decurrent. III. ii. Sea sand at Algeciras, *P. L.*

C. sonchifolia L. Sand-dunes; rare; 5–6. Somewhat like *C. sphærocephala*, but scabrid-pubescent, leaves shortly decurrent, heads large, disc florets white, phyllaries with 5 rather short reflexed spines. II. Sea sand at Gibraltar, *Brouss.* Probably on Neutral Ground.

C. aspera L. Dry stony and sandy hills; locally common;

5–7. Much branched, 1–2 ft. high, leaves more or less asperous and cinereous, narrow, usually pinnatifid with narrow lobes, phyllaries pale green, spines 3–5, palmate. III. i. Cork Wood Crags! Alcadeza Crags!

C. sphærocephala L. Sand-dunes; very common; here and there abundant; 5–6. Prostrate, heads scarcely radiant, spines of phyllaries 5–7. I. Beyond Catalan Bay! Sentry Fence! II.! III.!

C. polyacantha Willd. Woods, hedges and heathy places; rather frequent; 4–6. Leaves more lobed than last, rays much longer and brighter, spines of phyllaries 9–13. I. *Findlay*!? I believe this species, but not labelled. II. *K.*, *D.* III. i. Carteia, *K.* Second Pine Wood! Pine Wood Plains! Near San Roque Station! Cork Woods! Beyond Alcadeza! ii. Palmones Pinar and Playazo! iii. Guadacorte! Palmones, *Rev.*

[*C. acaulis* Haens. (*C. Hænseleri* B. & R.) is reported by Kelaart from the Carteian Hills.]

C. Calcitrapa L. Waste places and roadsides; very common; 6–8. I. Europa and Windmill Hill Flats! North Front! Glacis! II.! III.!

C. melitensis L. Roadsides and cultivated fields; locally frequent; 5–6. Stem winged, florets yellow, glandular. I. From Middle Gate to Jews' Cemetery! Between Ince's and Castle! III. i. Near Malaga Gardens! Path to First Pine Wood! Campamento Common! ii. Dry hills at Algeciras, *Rev.*

[*C. solstitialis* L. a similar species, but spines much longer and florets eglandular, was found by Kelaart on the Glacis, introduced.]

Echinops strigosus L. Cornfields; locally frequent; 5–6. III. i. Around San Roque, especially on north! ii. Near Algeciras, *Rev.*

Scolymus maculatus L. Fields and roadsides; very common; 5–6. I. Cultivated fields on west slopes, *K.*, *D.*; not there now, I think; there are only one or two small cultivated fields left. By Haynes's Foundry! II.! III.!

S. hispanicus L. Similar places; very common; 5–7. I.! II.! III.!

Cichorium Intybus L. Fields and waste places; common; 5–6. Varies greatly in stature and habit. Only var. *divaricatum* DC. is admitted by Debeaux, which Perez Lara observes is inseparable by any constant character, and the type certainly occurs. Dwarf prostrate forms are frequent, usually the result of browsing by cattle. I. Europa! South Barracks! Queen's Road! North Front! II.! III. i. and ii.!

Tolpis barbata Gaertn. Fields, woods and mountains; very common; 4–6. III.! Chiefly in i.!

Var. *grandiflora* Ball is dwarf, leaves twice as broad, incisodentate, heads large, central florets purplish. III. ii. Sands near Algeciras, *Ball.*

Hedypnois pendula DC. Grassy and bushy places; very frequent, at least locally; 3–5. The first three species of this genus are in much confusion. *H. pendula* and *H. tubæformis*, as

extremes, are very distinct, but are connected by many intermediates, varying in habit, hispidity, leaf cutting, and inflation of peduncles. I only cite stations in which I have collected specimens. *H. pendula* is erect, usually glabrous, very slender, buds nodding, leaves bright green, flaccid. I. Common on lower parts! III. i. Puente Mayorga!

Var. *pinnatifida* DC. has leaves pinnatifid and phyllaries hispid at tips. Probably frequent. I. Reclamation Road!

Var. *rhagadioloides* Lge. (sub *H. polymorpha*) is similar, but hispid all over. I. Europa Flats! I think frequent elsewhere.

H. cretica Will. (*H. polymorpha* DC.?). Open grassy and sandy places; very common; 3–5. Always more or less prostrate, peduncles somewhat inflated, but not more than one-third the diameter of fruit heads. Varies as much in leaf cutting and hispidity as last, but leaves never bright green, usually thick. I. Europa Flats! Above Alameda! North Front! Sentry Fence! II.! III. i. Near Linea Cemetery! (with pinnatifid leaves). Near Pinar de los Bigotes!

H. tubæformis Ten. (*H. cretica* var. *subacaulis* DC.). Similar places; very common; 3–5. Perhaps a variety of last, with peduncles greatly inflated, at least half diameter of fruiting heads. III. ii. Path near Reina Cristina Hotel, and elsewhere!

H. arenaria DC. In deep sand; frequent; 4–6. Very like a *Hypochæris*; anthodes much larger than in last three, and pappus rays always numerous. I. West side and sea sands near Old Mole, *K.*; not there now, I think. East side, *Boiss.* Sentry Fence! II.! III. i. Linea! Carteian Hills! ii. Palmones Playazo! Sandy Bay! iii. Palmones Sands!

[*H. pygmæa* Wk. I gathered a few specimens of a very small species near the road and Spanish Lines on eastern side of Neutral Ground, which may belong to this species, but they were in flower only, and I was unable to find them again to get fruit.]

†*Hyoseris scabra* L. (*H. microcephala* Cass.). Dry rocky and gravelly places; rather rare; 3–5. I. Buena Vista to Europa Flats! III. i. Slopes of San Roque, *D.*

H. radiata L. Similar places; abundant on Rock, rather common in Spain. I.! III. i. About San Roque! Queen of Spain's Chair! Cork Woods! ii. and iii.!

†*Rhagadiolus stellatus* DC. Grassy fields or bushy places in light soil; occasional; 4–5. The type has lower leaves oblong-lanceolate, dentate, not lobed. I. *K.* III. i. Foot of San Roque, *K.*, *D.* Carteian Hills! Alcadeza! Almoraima! ii. Algeciras Station! M. de la Torre!

Var. *edulis* DC. has leaves lyrate pinnatifid, the terminal lobe large, orbicular. I think as common as type and mixed with it!

Thrincia hispida Roth. Grassy and rough places; both varieties abundant; 1–12, chiefly 4–5.

Var. *minor* Boiss. is smaller in all parts, scapes 1–3 in. I.! II.! III.!

Var. *major* Boiss. is more hirsute, scapes 3–12 in., thickened at apex, heads twice the size. I.! II.! III.!

T. tuberosa DC. Open grassy fields; common; 10–4. All achenes with beak about half their length. III. i. and ii.!

T. maroccana Pers. Similar places; rare? 5. Annual, outer achenes shortly, inner very longly beaked, but this is variable. It may be only a first year's flowering of last. I. *Frere.* III. i. Near San Roque, *Boiss.*

†*Leontodon hispanicus* Mer. var. *psilocalyx* Wk. Very hispid, all achenes with pappus, not inner only. III. ii. Sandy hills near Algeciras, *Winkl.*

Helminthia echioides Gaertn. Hedges and bushy places; occasional; 5–9. Outer phyllaries cordate, as long as lanceolate inner. I. Scud Hill, *Dumbreck.* Gibraltar, *K.* III. i. Abundantly by San Roque Road, *K.* ii. Algeciras, *Rev.*

H. comosa Boiss. Similar places; rather common; 5–6. Stem and leaves with much larger and more numerous asperities on tubercles, outer phyllaries ovate or lanceolate, one-third as long as inner. II.! III.! A dwarf form is abundant on Carnero Hills!

Urospermum picroides Desf. Dry bushy, grassy and sandy places; common; 3–5. I.! II.! III.!

Picris hieracioides L. Stony and rocky places; rare; 6–7. III. i. Roadsides near San Roque, *D.*

Podospermum calcitrapifolium DC. Grassy places and by ditches; occasional or frequent; 4–5. III. i. Carteian Hills! San Roque! Foot of Chair! iii. Salt Pans! Near Palmones Village, often in a very dwarf form!

Scorzonera hispanica L. var. *latifolia* Koch. Cornfields; rare? 4–6. Phyllaries very unequal, leaves broad, III. iii. Between San Roque and Algeciras, *Winkl.*

†Var. *glastifolia* Wallr. has leaves about 2 lines broad, and is the only form I have seen. It is frequent. III. i. and ii.!

Tragopogon porrifolius L.? Sandy and grassy places; rare or next mistaken for it? 4–5. Flowers purple, achenes abruptly narrowed into a long beak, pappus of all achenes plumose. I. *Brouss.* An escape?

†Var. *australis* P. L. Leaves undulate, florets much shorter than phyllaries, achenes gradually attenuate into a beak shorter than fruit. III. i. Near San Roque, *D.*, who does not record next; a possible error?

Geropogon glaber L. Cornfields and grassy places; locally frequent; 4–5. Flowers pale purple, pappus of outer achenes of 5 short pales, not of hairs. III. i. Hills over San Roque Station! ii. Railside near Algeciras! Towards Sandy Bay!

Hypochæris radicata L. Sandy places; frequent or common; 4–6. Tall, often 2 ft. high, scapes elongate, erectly branched, all achenes with beak longer than fruit. III.!

Var. *heterocarpa* Mor. has outer achenes not beaked. III. ii. About Algeciras, *Rev.*

H. Salzmanniana Coss. Sand-dunes; very common; 2–6. Annual, flowers as large as last, phyllaries hispid or glabrous, leaves usually hispid-ciliate. Sometimes regarded as a variety of *H. glabra*, but very distinct. II.! III.!

†*H. glabra* L. Sandy fields; frequent? 2–6. Annual, glabrous, flowers small, closing at noon. Varies in length of beak of outer and inner achenes, but no varieties recorded in our limits. III. i. and ii.!

[*Seriola ætnensis* L. A specimen from Willkomm at Kew labelled "Malaga and Gibraltar" was probably gathered near the former place. Kelaart records it from the neighbourhood of Gibraltar.]

Taraxacum officinale Wigg. (*T. Dens-leonis* Desf.). Grassy places and roadsides; rare; 5–6. Kelaart records var. *lævigatum* DC., with runcinate pinnatifid leaves, and var. *obovatum* DC., with them entire, from the Rock. There is little doubt that he mistook *Hyoseris radiata* for it. [I. *K.*] III. ii. Algeciras, *Rev.*

Lactuca tenerrima Pourr. Rocks and old walls; locally very common; 6–7. Usually as †var. *scabra* Boiss., with scabrid white hairs, but the type occurs. I.! III. ii. Walls at Algeciras and El Cobre!

L. saligna L. Ditches and banks; rare; 7–9. Stem leaves narrow, entire, sagittate; the radical often sinuate-lobed. III. i. Railway about San Roque Station! ii. Railside near Algeciras!? iii. Salt Pans!? Guadacorte Marsh!? Leaves only seen in last three stations, which may have belonged to *L. Scariola* L., a common species in the province.

Picridium tingitanum Desf. Sands by sea, and rocky places; frequent? 4–6. Usually short, phyllaries broadly ovate, squarrose, the outer acuminate, conspicuously broadly scarious, white-edged. I. Clefts of rocks on west slopes, *K.*, *D.*, *Rev.* II. *ib.* III. ii. Algeciras, *Rev.*

P. intermedium Schultz. Sandy and gravelly places; common; 2–5. Annual, slender, leaves thin, green. I.! III.!

P. vulgare Desf. var. *crassifolium* Wk. Rocks and sandy places near sea; rather frequent; 1–12, chiefly 3–5. Perennial, phyllaries lanceolate, outer not squarrose, nor broadly winged. The type, which is not recorded, has the habit of *P. intermedium*, the var. is dense and compact, with thick fleshy leaves. I.! II.! III. i. San Roque, *Colm.* ii. Palmones Playazo! Sandy Bay! Carnero Point!

†Var. *maritimum* Boiss. Has all leaves pinnatipartite, with narrow segments. I. East and south slopes, *Boiss.*, *K.*, *D.* III. ii. Palmones Playazo!

Sonchus tenerrimus L. Rocks, bushy places, and old walls; very common; 1–12, chiefly 2–6. Varies greatly in leaf cutting and size of flower.

†Var. *lævigatus* Lge. (var. *annuus* Lge. ?). Annual, peduncles glabrous, leaf segments narrow, acute. I. *D.* III. ii. Waterfall Valley!

Var. *glandulosus* Lge. Annual, peduncles densely glandular, leaf segments broadly oval, obtuse. I. *Wk.* III. ii. Near Algeciras, *Winkl.*

†Var. *spinulosus* Lge. As last, but leaf segments acute or acuminate, much spinulose dentate. III. i. Alcadeza Crags!

Var. *perennis* Lge. Perennial, peduncles and heads glabrous

or glandular, leaves various. Much the commonest form. I.! III. i. Carteia! Alcadeza! Malaga Gardens! ii. from Palmones Playazo to Carnero Point!

S. oleraceus L. Roadsides, grassy places and by streams; frequent; 1–12. Leaf auricles acute, deflexed or spreading, achenes rugose. I.! II.! III. i. and ii.!

S. asper Vill. Similar places; less frequent; 3–9. Auricles deflexed and rounded, achenes ribbed, not rugose. I. Rare, *K.* II.! III.!

S. glaucescens Jord. Sandy cultivated fields; rare; 3–5. Biennial, leaves thick, heads twice the size of last, achenes more or less winged, retrorsely ciliate. III. ii. Near Algeciras, *Winkl.*

Ætheorrhiza bulbosa Cass. In deep sand, occasionally stony places; common; 3–5. I. Near O'Hara's! Near Willis's! Catalan Bay! II.! III.!

†*Barkhausia fœtida* DC. Old walls and waste places; rare? 6. Like next, but outer achenes more shortly beaked, flowers subsolitary, nodding in bud, peduncles thickened at top. I. South and west slopes, *K.*, *D.*

B. taraxacifolia Thuill. Fields and rough bushy places; abundant; 12–5. Most variable, either cæspitose and spreading, or erect, with solitary stems branched at top. I. Chiefly lower north and west slopes! III.!

†Var. *Haenseleri* Boiss. Glabrescent, leaves obtuse, dentate, not lobed. I.! Rare?

Crepis tingitana Ball. Woods and heathy slopes; locally frequent; 3–5. Like a *Hieracium*, little branched, leaves few, large, basal subtruncate, cauline narrowed below. III. i. Cork Woods! Majarambout Crags! ii. Mountains!

C. virens L. Dry sandy places, occasional; 3–5. Unlike any British form, but agreeing closely with the eastern *C. parviflora* Desf. Erect, corymbosely branched, leaves mostly radical, dentate, flowers rather small, pale yellow, often reddish on back, fading to orange. I. Above the Library! North Front! II.! III.! Chiefly about Palmones and Guadacorte!

Var. *runcinata* Bischff. has basal leaves runcinate pinnatifid. III. i. Grassy fields at San Roque, *D.*

†*C. corymbosa* Ten. Similar places? rare; 6. Annual, more or less pubescent, 1 ft. or more high, leaves spathulate, runcinate. Anthodes 4 lines long, on long slender peduncles in lax paniculate cymes, achenes not beaked. III. ii. S. de Palma. *Rev.*

†Var. *bætica* Wk. has stems more pubescent, leaves sinuate dentate, heads smaller, and phyllaries glabrous inside. III. ii. With type, *Rev.*

Andryala integrifolia L. Dry rocky or bushy places; common; 5–7. Biennial, canescent and softly tomentose, receptacle with very long setæ, pappus as long as phyllaries. The type (var. *corymbosa* Wk., *A. parviflora* var. *latifolia* Boiss.) is much branched at top, heads 4 lines, in a compact corymb, leaves entire or only dentate, often undulate. I.! II.! III. i. and ii.!

Var. *sinuata* Wk. Leaves narrow, more or less sinuate-

dentate, or runcinate pinnatifid, cymes laxer, heads smaller. I. Common, *K.*, *D.*, *Boiss.* III. ii. Algeciras, *Rev.*

A. arenaria B. & R. Sandy places; frequent, locally common; 3–5. Annual, much more softly tomentose, receptacle with short setuli, pappus shorter than phyllaries, corymb small, dense, flowers orange, red on back. II. *K.*, *Boiss.* III. i. Cork Woods! Pine Wood Plains! Foot of San Roque, *K.*, *Boiss.*

A. laxiflora DC. Rocky slopes; rare; 6. Like last but anthodes 5 lines, on longish peduncles in a lax corymb, flowers pale yellow. I. *D.*

Xanthium macrocarpum DC. Sandy, rather damp places; locally abundant; 7–9. Like *X. italicum* but with much stouter fruit spines, apical beak incurved. II.! III. i. Punta Mala! ii. Palmones Playazo!

X. spinosum L. Roadsides and sandy waste places; occasional; 4–9. II.! III. i. Campamento and roadside to San Roque! Lajo banks! Near San Roque Station! ii. About Algeciras! iii. Palmones Village!

X. italicum Moretti. Rather damp sandy places and by rivers; rather rare? 7–9. II.!? Only detached fruit seen. III. ii. Palmones Playazo!

Campanulaceæ.

Laurentia Michelii DC. Stream beds and under damp rocks; rather frequent; 4–6. III. i. Queen of Spain's Chair, chiefly east slopes! ii. Mountains!

Lobelia urens L. Streams and damp hollows; frequent in mountains, occasional elsewhere; 4–6.

Var. *longibracteata* P. L. has bracts longer than calyx, sometimes than corolla, and longer calyx lobes. It is said to be the common form, but the type certainly occurs frequently, and I have not distinguished them. III. i. Hedges at Campamento in profusion, *K.* Queen of Spain's Chair! Alcadeza! Cork Woods! ii. Mountains! iii. Palmones Sands!

†*Jasione montana* L. Sandy and heathy places; frequent; 4–6. Varies greatly in habit, duration, and length of calyx segments and pedicels. The type is not recorded.

Var. *echinata* Wk. (var. *dentata* DC.). Biennial, stout, erect, 12–18 in. The usual mountain and wood form. I. *Boiss.* III. i. Queen of Spain's Chair! San Roque, *B. & R.* Cork Woods! ii. S. de Palma, *Rev.* El Cobre!

Var. *bracteosa* Wk. (var. *littoralis* Boiss., *J. blepharodon* B. & R.). Shorter, more cæspitose, with different calyx segments. The form of sandy open spots. I. Catalan Bay! Mediterranean Steps, *K.* III. i. San Roque, *Boiss, D.* My 1306, a very dwarf cæspitose hispid form, from near La Tunares, probably belongs here.

†*J. rosularis* B. & R. Heathy hills; rare; 4–6. Perennial, basal leaves rosulate, heads large, calyx segments lanceolate, rigid, longly pungent acuminate, thrice as long as tube. The station cited is the classic one, but I have referred all I have seen there to *J. montana* var. *echinata*. III. i. Queen of Spain's Chair, *B. & R.*, *D.*

Campanula mollis L. Rocks; locally frequent; 5–7. I.!

†Var. *microphylla* DC. has smaller ovate acute subdentate cauline leaves, and is mixed with the type. I. *Brouss.*

C. dichotoma L. †var. *brachiata* A. DC. Dry sandy banks; rare; 5–6. Annual, erect, calycine appendages narrow, as long as tube, but they vary in *C. mollis*, and dried specimens are not always easily distinguished. I. *Gouan*! and by an unknown collector, both labelled *C. mollis*, but placed in this cover at Kew. III. i. Escarpments of San Roque, *D.*

C. Erinus L. Rocks, old walls and dry stony places; common; 4–5. I.! III. i. Cachon! First Venta! ii. On railway! Waterfall! El Cobre! iii. Palmones!

C. Rapunculus L. Bushy places in woods and hills; common; 4–6. Varies in habit, the strict forms usually more hispid than the diffusely branched ones, but the varieties are not clearly distinguished. I. Near Bruce's Farm! III.!

C. patula L.? Woods and bushy places; rare or error? 5–7. Biennial, stems rather stout, strict, basal leaves rosulate, corolla reddish violet, lobes rather long and narrow, widely spreading. I. *Brouss.*! a poor specimen, which I think belongs to the next species.

C. Lœflingii Brot. (*C. erinoides* L.). Sandy bushy places, occasionally in mountains; common, often abundant; 4–6. Annual, slender, much branched from base, without a rosette, corolla smaller, less open, black at the base, not white as described. Its habit and appearance are very different from *C. patula*. I. Not very common, chiefly on higher parts, *K.* III.! My 2032, in fields towards S. Lorca, is shorter and more cæspitose, the corolla without a dark base, and calyx segments much broader. I suspect it belongs here.

†Var. *filiformis* Lge. Very slender, elongate, retrorsely scabrid, branches elongate, calyx segments scabrid, very longly setaceous. III. ii. Sands near Algeciras, *Kusinsky*.

Trachelium cæruleum L. Rather damp walls and banks; occasional; 5–6. III. i. Lajo near upper ford, and above First Pine Wood! Railside beyond Almoraima! ii. By R. Lobo! Roadside at Puente de los Pastores! Waterfall Valley!

ERICACEÆ.

Arbutus Unedo L. Woods and mountain slopes; locally frequent; 10–12. III. i. Cork Woods! ii. Mountains to highest ridge!

Rhododendron bæticum B. & R. Mountain valleys; locally common; 4–6. III. [i. Castellar, beyond our limits, *K.*] ii. Mountains to highest ridge!

Erica ciliaris L. Heathy places in mountains and woods; occasional; 7–10. III. i. Queen of Spain's Chair! ii. Mountains!

E. arborea L. Similar places; much commoner; 3–4. III. i. Cork Woods! ii. Mountains!

E. scoparia L. Similar places; very common; 4–5. III. i. Queen of Spain's Chair! Cork Woods! Alcadeza Crags! ii. Mountains!

E. australis L. Similar places; common; 12–1. III. i. and ii. Same stations, also Palmones Pinar!

E. umbellata L. Similar places; occasional; 2–6. III. i. Cork Woods, especially near Second Pine Wood! Alcadeza Crags and Plains! ii. Mountains!

Var. *subcampanulata* DC. Throat of corolla more open, stamens shorter. III. ii. S. de Saladillo, *P. L.*

†Var. *major* Coss. Corolla nearly twice the size, 2½-3 lines long, anthers larger but less exserted. III. i. Near San Roque, *Wk.* ii. S. de Palma, *Rev.*

†Var. *anandra* Lge. Corolla larger than type, cylindrical, anthers none. III. ii. S. de Luna near Los Barrios, *Nilss.*

E. mediterranea L. Similar places; rare; 1–3. III. ii. Hills behind Algeciras, *Frere.*

Calluna vulgaris Salisb. Similar places; abundant; 7–13. III. i. and ii.!

†Var. *depressa* W.-Dod. in Journ. Bot., 1914, p. 13. Prostrate, stems tortuous, intricate. III. i. All over Bonel's Farm!

OLEACEÆ.

Jasminum fruticans L. Rocky bushy places; very common; 3–5. I.!

Olea europæa L. Mountain and hill slopes; common; 5–6. [I. A few trees cultivated in Kelaart's time.]

Var. *oleaster* DC. The wild form, with much smaller fruit. I.! III.!

Phillyrea latifolia L. Woods; occasional, or locally frequent; 2–4. Described as a tree, 18–24 ft. high; I have only seen it as a bush, 8–10 ft., often much less; leaves rather deeply and very acutely serrate, or almost entire on the same bush, fruit globose, umbilicate at apex. III. i. Cork Woods near Second Venta! ii. Waterfall Valley!

†Var. *obliqua* Ait., with elliptical lanceolate leaves, teeth almost obsolete. III. ii. With type in S. de Palma, *Wk.*

P. media L. Similar places; rare? 12–1. Very like last, but a rounder fuller bush, with finely toothed leaves, about twice as long as broad, fruit globose, abruptly mucronate, not umbilicate. I. Old Man's Garden! Near Corsican's Post! Levant! I think not common all over the Rock, as Kelaart and Dautez report. III. ii. Recorded in my notes, but authority mislaid.

P. angustifolia L. Similar places; common; 1–4. Leaves almost linear. III. i. Malaga Gardens! Alcadeza Crags! Cork Woods! ii. Palmones Playazo, a broad-leaved form! Mountains! iii. Palmones Sands!

Fraxinus angustifolia Vahl. Woods and hedges; rather frequent; 1–2. [I. Engineer Road and about Alameda, not native?] III. i. Alcadeza! Railway near Guadarranque River! Cork Wood Sotos! ii. M. de la Torre! Near Palmones railway bridge! iii. Guadacorte!

Apocynaceæ.

Vinca media Hoffm. & Link. Banks and bushy places; abundant; 12–4. I.! III.! With white flowers near Levant, below Signal Station, and railside near Long Stables!

Nerium Oleander L. By streams and rivers; very common; 5–9. [I. Native, *K.*] I think this doubtful. III.!

Asclepiadaceæ.

*†*Gomphocarpus fruticosus* R. Br. Among bushes; rare; 5–6. III. ii. At El Cobre, quite naturalized!

Gentianaceæ.

Chlora perfoliata L. Hill slopes and banks; occasional; 5–8. Cauline leaves connate for their whole width, calyx divided to base, segments linear-subulate, shorter than corolla. I. Near Signal Station Road! Catalan Bay, *Hurst*! III. i. Upper Lajo and Alcadeza! ii. El Cobre, both very slender forms! Carnero Hills! iii. Palmones!

Var. *sessilifolia* Griseb. More slender, shorter, leaves longer, more acute, scarcely connate except uppermost. Connects with next through its var. *lanceolata* Koch. III. i. Woody places about San Roque, *D.* ii. Algeciras, *Rev.*

C. imperfoliata L. f. Similar places, partial to damp; occasional; 5–6. Lower and middle leaves not connate, flowers longly peduncled, calyx segments broadly linear-lanceolate, connate at base, longer than corolla. II.! III. i. Bonel's Farm! iii. Palmones Sands! Guadacorte!

Cicendia filiformis Delarb. Rather damp sandy places; locally frequent; 4–6. III. I. Bonel's Farm and lower east slopes of Chair! ii. Near Palmones Pinar! Rare in mountains!

†C. pusilla Griseb. Similar places; rare; 5–7. III. i. Near San Roque, *Ball*! ii. S. de Palma in Los Barrios district, *Rev.*

Erythræa maritima Pers. Dry grassy and sandy places; rather frequent; 4–6. Flowers yellow. III. i. and ii.! Not seen north of San Roque, but occurs in Algeciras mountains!

E. spicata Pers. *†*var. *glauca* Rev. Salt marshes; locally frequent; 6–9. III. iii. Salt Pans! Guadacorte marshes!

E. ramosissima Pers. (*E. pulchella* Hornem.). Sandy banks and grassy places, partial to damp; locally frequent; 4–8. Varies much in habit. Starved forms from Guadarranque marshes may be f. *gracilis* Daut. & Deb. III. i. Between Neutral Ground and Guadarranque River, *D.* ii. Hills round Algeciras! Carnero Hills! iii. Palmones Sands and Marshes!

E. latifolia Sm. var. *tenuiflora* Hoffm. & Link. Similar places; rare; 4–8. Resembles last, but much taller, much branched above only, with subcorymbose inflorescence, leaves broader. III. ii. Saline marshes and sands at Algeciras, *Rev.* iii. Guadacorte Marshes!

†E. Barrelieri L. Dry or rocky hills; rare; 6–8. Distinct from all in its long linear-subulate leaves, and large pedicelled flowers. III. i. S. Carbonera, *D.*

E. Centaurium Pers. Dry rough and bushy places, and woods; occasional or frequent; 5–7. Flowers sessile, medium-sized, always in a flat-topped more or less dense corymb. I. A large-flowered form from east slopes below Middle Hill may be the true var. *grandiflora* Pers. (non Biv.), and a dwarf form with a rosette of very broad leaves, from the foot of the precipice below, may be the same! Type not seen. III. i. and ii.! A white or very pale pink-flowered form replaces the normal about El Cobre!

Var. *suffruticosa* Griseb. has stem subwoody at base, and shorter corolla lobes, but most specimens I have seen so labelled are quite herbaceous at the base. I. Not frequent, *K.* III. i. In great abundance on road to Cork Woods in company with *E. major*, K. No *Erythræa* is abundant there now, but type *E. Centaurium* is fairly frequent. San Roque, *Boiss.* iii. Hills near Los Barrios, *P. L.* Perhaps outside our limits.

E. grandiflora Biv. (*E. Boissieri* Wk., *E. sanguinea* Mab.?, *E. Centaurium* var. *grandiflora* Pers.?). Similar places and by ditches; frequent in Spain, rather rare on Rock; 5–7. Flowers very large, in a lax cyme, not a compact corymb. I.! III.!

†*E. acutiflora* Schott. Similar places; rare; 6. Short, leaves very acute, corolla lobes narrow, acute. The description hardly differentiates it from *E. tenuiflora.* III. i. By streams of San Roque, *Schott.* ii. Damp places at Algeciras, *Rev.*

[Bignoniaceæ.]

[*Catalpa syringæflora* Sims is only cultivated.]

Convolvulaceæ.

Convolvulus althæoides L. Dry fields, &c., abundant; 4–6. I! II.! III.!

C. arvensis L. Fields and sandy places; very common; 5–8. I.! III.!

†Var. *linearifolius* Choisy, with elongate broadly linear leaves, is alone recorded by Debeaux, but the type is much more frequent. I. *K.*

†*C. siculus* L. Dry bushy and stony places; frequent on the Rock; 3–5. I.! III. i. Queen of Spain's Chair; rare!

†*C. undulatus* Cav. Cultivated and sandy fields; rare; 4–6. Annual, leaves broadly oblong, flowers subsessile, axillary. III. i. Foot of San Roque, *Wk.*

C. tricolor L. Fields; common, sometimes abundant; 4–6. Flowers bright blue, with white tube and yellow throat, sepals hirsute, in a cylindrical tube at base, spreading above, occasionally spathulate. A very pale-flowered form occurs, quite distinct from next. I. Rare, near Naval Hospital, *K.* II.! III.!

C. meonanthus Hoffm. & Link. Similar places, also on rough hills; common, often a field full; 4–5. Flowers smaller, pale lilac, not blue, sepals subglabrous, in a conical tube from base, not spreading above. The two species seldom grow together. III. i. Much commoner than last! ii. and iii.!

Calystegia sepium R. Br. Hedges and woods, perhaps often planted; frequent; 5–7. [I. Hedges at St. Bernard's, but not native on Rock!] III.!

Var. *sylvestris* Wk., flowers much larger, bracts very large and overlapping. I believe frequent, but have not distinguished it. III. ii. Damp places by R. Ancho near Algeciras, *P. L.* El Cobre!?

C. Soldanella R. Br. Sand-dunes by sea; local; 4–6. III. ii. and iii. About Palmones, on both sides of River!

†*Cuscuta Epithymum L.* On many low growing plants; rather frequent; 5–7. The type has corolla tube much longer than the very broad short calyx segments, and does not, I believe, occur.

†Var. *angustata* Engelm. has a very short corolla tube, the lobes and calyx segments triangular, longly acuminate. I. Upper and middle slopes! III. i. Queen of Spain's Chair! Carteian Hills! Alcadeza! ii. By Algeciras Cemetery! Carnero Hills! Common in mountains!

Var. *Kotschyi* Engelm., differs from var. *angustata* only in smaller heads of closely sessile flowers, and stouter stem. I. On *Brachypodium pinnatum*, D.

†Var. *obtusata* Engelm. has few-flowered glomerules, pedicels longer than calyx, and broadly ovate calyx and corolla lobes. III. ii. S. de Luna in Los Barrios district, *Nilss.*

Boraginaceæ.

Heliotropium europæum L. Dry cultivated fields, roadsides, and waste places; frequent; 6–11. Var. *tenuiflora* Guss. is the commoner form in the province, and may be ours. I. Lighthouse! By Kennels! Above Devil's Gap! II. Forms large beds, *K.* I have not seen it there at all. III. i. By Francia's Farm! Near Bonel's Farm! Rail near San Roque Station! ii. Algeciras Station, &c.! iii. Palmones Village!

H. supinum L. Similar places, often on dried mud; rare? flowers too late for my observations of its distribution; 6–7. III. i. In San Roque! Roadside beyond Francia's Farm! iii. About Los Barrios Station!

Cerinthe major L. Roadsides and fallow fields; abundant; 2–5. The type has yellowish-green bracts, and either yellowish or purple flowers, and is the sylvan form. I. Above Ince's! Sunnyside Steps! North Front, *Frere.* II.! III. i. Cork Woods, &c.! ii. and iii. rare!

Var. *purpurascens* Boiss. Bracts as well as flowers dark purple; much commoner than type in open ground. I. *K.* II. *K.* III.!

Anchusa calcarea Boiss. Sandy fields; rare; 3–6. Flowers small, violet purple, calyx shortly 5-fid. III. i. At Foot of San Roque, *Boiss, Wk., D.*

Var. *scaberrima* Boiss. is much more setose. III. i. With type, *ib.*

A. italica Retz. Fields; common; 4–5. I. Mediterranean Road, but more abundant on lower parts, *K.* A specimen in herb.

Balestrino, labelled *Lithospermum purpureo-cœruleum*, probably came from the Rock, where it does not now, I think, occur. III.!

Borago officinalis L. Roadsides, fields, and waste places; very common, sometimes in masses; 2–5. Occasionally with white flowers. I.! II.! III.!

Echium Pomponium L. (*E. glomeratum* Boiss.). Rocky places; rare; 5–6. The largest of our species, racemes many, lateral, densely covered with yellowish flowers. *E. flavum* Desf. may not be distinct; Lemann's specimen is so labelled. My own closely resembles Jacquin's figure of *E. altissimum* (*E. italicum* L.), but that has usually a much laxer panicle. I. Mediterranean Steps!

E. pustulatum Sibth. & Sm. Chiefly sand-dunes; rather frequent; 5–6. Very hispid, leaves narrow, panicle often cylindrical, but equally often much branched, corolla usually reddish purple. I. Rocky places on south and west slopes, *Wk.*, *K.*, *D.* III. i. Towards Pedrera! Near Tunares! Punta Mala! Cork Wood Crags, &c.! ii. Palmones Playazo! iii. Palmones Village and Sands!

[*E. italicum* L., resembling *E. Pomponium*, but usually much more branched, and with pale bluish flowers, has been found by Perez Lara at Boca de Leon, just beyond our limits.]

†*E. maritimum* Willd. Sandy ground; rare; 3–6. Distinguished from all others but *E. calycinum* by its included stamens, and from that by its larger deeper purple flowers. I. Devil's Gap to Queen's Gate! III. i. Punta Mala! Sea sand at foot of S. Carbonera and of San Roque, *Wk.*

E. plantagineum L. Sandy fields; abundant; 4–6. Leaves almost silky, stem little asperous, flowers very large. Varies greatly in habit, either with a single, erect, simple or branched stem, radical leaves withered by time of flowering, or, more commonly, with a radical rosette of very broad leaves, with several prostrate lateral and one central erect stem. I. Rare upper, more frequent lower slopes! North Front! II.! III.!

E. creticum L. Rocky slopes, very common on Rock; 3–5. Like the erect form of last, but much more asperous, especially leaves. I.! II. *K.*, *D.* III. i. Sand-dunes at San Roque, *Wk.* Alcadeza!

E. calycinum Viv. (*E. parviflorum* Moench.). Roadsides and stony places; common; 2–4. Flowers small, pale blue, stamens all included. I. General, but chiefly south!

[*Lithospermum purpureo-cœruleum* Willd. was communicated to Kelaart, certainly in error. A specimen of *Anchusa italica* is so labelled in herb. Balestrino.]

L. fruticosum L. Heathy places in woods and mountains; frequent; 1–6. Perez Lara says our variety is his *prostratum*, but the characters are very indefinite, and Debeaux only admits var. *erectum* Coss. I. *Frere*. III. i. Queen of Spain's Chair! Pine Wood Plains! Cork Woods! ii. Mountains!

[*L. officinale* L. Recorded from the Rock by Kelaart, either in error or as a casual.]

L. arvense L. Fields and roadsides; rare; 3–5. III. i. Linea! Near San Roque! ii. Algeciras Station!

L. apulum Vahl. Dry hills; frequent; 3–5. III. i. Carteian Hills! Campamento Common!

Myosotis repens Don. (*M. palustris* Roth. var. *bætica* P. L.?). Marshes and streams; locally common; 4–6. Calyx tube conical, deeply cleft, teeth much longer than broad, flowers rather large. III. i. Near top of Chair! ii. Mountains! iii. Guadacorte!

†*M. lingulata* Lehm. (*M. cæspitosa* Schultz). Similar places; rare; 4–6. No aerial creeping stolons, leaves narrower, flowers smaller, corolla limb not wider than length of tube. III. ii. Hills near San Bernabe!

†*M. sicula* Guss. Similar places; rare; 5–6. Annual, pedicels ebracteate, scarcely longer than calyx, usually ascending in fruit. III. iii. Boggy meadows near Palmones, *Winkl.*

†*M. maritima* Hochst.? Marshes near sea; rare; 5. Perennial, base of stem woody, hairs on tubercles, flowers very large and pale. An Azorean species. III. ii. Near Algeciras, *Rev.*

M. hispida Schl. (*M. collina* Reichb.). Sandy places, or in woods; frequent; 3–5. III. i. Cork Woods! ii. Palmones Playazo and Pinar! iii. Palmones Sands!

M. versicolor Pers. Similar or more grassy places; occasional; 3–5. III. i. Andalucian racecourse. Pinar de los Bigotes! Cork Woods! ii. Algeciras Golf Links! Palmones Playazo and Pinar! Near M. de la Torre! iii. Palmones Sands!

M. intermedia Link. (*M. arvensis* Hill). Sandy fields; rare; 3–5. III. [i. Near Gibraltar, *K.* Not "at Gibraltar," as Debeaux says.] ii. Near Algeciras, Clem.

[*M. sylvatica* Hoffm. Debeaux credits Kelaart with this from near San Roque, but Kelaart only reports it from the neighbourhood of Gibraltar, probably outside our limits.]

Cynoglossum cheirifolium L. Rocky and stony places; occasional; 2–4. The corolla is described as rosy, fading to violet or blue, but the limb is permanently cream-coloured, the tube and throat processes deep maroon. I. Jews' Cemetery! Ince's! Willis's! III. i. San Roque, *D.* ii. Algeciras, *D.*

C. clandestinum Desf. Dry hills and sandy places; frequent; 2–4. III.!

C. pictum Ait. Similar places; frequent; 3–5. I. In great abundance on middle parts, *K.* I have only seen a single specimen near Green's Lodge! III.!

Omphalodes linifolia Pourr. Dry bushy places; locally frequent; 5. III. i. Cork Wood Crags! Alcadeza Crags!

[*Symphytum tuberosum* L. was communicated to Kelaart from the Rock. Error or casual?]

Solanaceæ.

Solanum nigrum L. Roadsides and waste places; rare; 1–12. The black berries are the only constant feature; leaf lobing, hairiness, and size and colour of flowers vary greatly. I. Sand-

pits! North Front! III. i. Cork Woods! ii. El Cobre! Near M. de la Torre!

Var. *miniatum* Mert. & Koch. Much commoner. I.! III.! Rare in ii.

Var. *suffruticosum* Moris is 3–5 ft. high, woody at base. A common var. in the province, but rare with us. I. Devil's Gap and elsewhere!

S. villosum Lamk. Similar places; occasional? 1–12. Softly pubescent, musk-scented, flowers twice as large, fruit orange yellow. I have not seen fruit, and believe my gatherings are villous form of *S. nigrum*. I. Common, *K.*, *D.* Above Engineer Road!? III. i. Almendral!? ii. Algeciras Station!? El Cobre!? with small violet flowers.

S. sodomæum L. Waste sandy places, mostly near cottages; frequent; 2-11, but chiefly 4–9. I. On lower, rarely upper Rock! II.! III. i. Linea! Alcadeza! Rare in Cork Woods! ii. and iii.! On charcoal burnings in the mountains!

S. Dulcamara L. By streams and sotos; locally frequent; 6–8. III. i. By Lajo from First Pine Wood to Almendral! Arroyo Viejo! Cork Woods!

[*Lycium europæum* L. Hedges; rare, probably nowhere native; 3–5. Corolla narrowly funnel-shaped, pale purple. I. Devil's Gap! Below main road, near St. Bernard's! III. i. Near Francia's Farm!]

[*L. afrum* L. Corolla broadly funnel-shaped, dark brownish purple. Hedges of gardens in Gibraltar, *D.*]

Mandragora autumnalis Spreng. Fields and grassy places; common; 9–1. III. i. Carteian Hills! Arroyo Viejo! Almoraima! ii. Hills near Algeciras!

Datura Stramonium L. Waste sandy places, chiefly near buildings; occasional; 4–11. I. Sporadic, as on North Front! III. i. Near San Roque Station! Campamento! Above Almoraima! iii. Palmones Village!

†Var. *chalybea* Koch has stem, petioles and calyces violet, flowers bluish. I. In lower part of town, *D.*

[*D. Metel* L. with entire leaves has occurred as a casual near the Landport, *K.*, *Pourr.*]

[*D. arborea* L. is only cultivated.]

[*Hyoscyamus niger* L. has been found as a casual on Europa Flats, *Frere.*]

H. albus L. Waste places; type rare; 1–12. I. Near Monkey's Cave!

Var. *major* P. L. has throat and stamens blackish purple, and is the commoner. I. Europa Flats! Moorish Castle! Near slaughter houses! Mediterranean Road! III. i. Alcadeza Crags!

**Nicotiana glauca* Grah. is quite naturalised at Catalan Bay, Engineer Road, Dockyard, and at Puente Mayorga!

[*Cestrum Parqui* L'Hérit. is an occasional escape. A bush grows on Neutral Ground just beyond our lines, but may be destroyed by the new road!]

Scrophulariaceæ.

Verbascum thapsiforme Schrad. Sandy ground; locally frequent; 4–6. I.? Leaves apparently of this species on slopes above Catalan Bay!? III. i. Cork Woods near Soto Gordo! ii. Palmones Playazo! iii. Palmones Village!

V. sinuatum L. Sandy banks and roadsides; frequent; 6–9. I.! II.! III.! With white flowers by railway near Guadacorte!

V. virgatum With. Similar places; rare; 5–6. III. i. By river above Almoraima! Lane to First Venta! Near San Roque, *Brouss.* iii. Palmones Village!

†*Scrophularia laxiflora* Lge. By streams and in woods; locally common; 3–5. Cymes very lax, much more so than in *S. aquatica*, flowers often pale, leaves not auricled. I. Near Willis's and catchment above! III. i. Cork Wood Sotos! ii. Mountain valleys!

[*S. lævigata* Vahl. A specimen from the Waterfall, my 884, exactly matches one from Ball, from same neighbourhood, labelled thus, but with a sign of doubt. It may be a form of last with leaves acutely doubly serrate. It is a Moroccan species.]

S. auriculata L. (*S. subverticillata* Moris). Damp places in open ground, not in woods; frequent; 3–9. Stout, cymes very dense, very dark-flowered, in a narrow raceme, flowers contiguous, bracts very broad, deeply lacerate, also sepals; leaves usually with one or two pairs of pinnæ at base. II.! III.!

†Var. *minor* Lge. (*L. aquatica* L.?) has probably been confounded with *S. laxiflora*, if it be really distinct. III. ii. Algeciras, *Rev.*

S. sambucifolia L. (*S. mellifera* Vahl.). Roadsides and ditches; rather common; 2–4. I. Sandpits! Above Alameda Parade! Engineer Road! III. i. and ii.!

S. canina L. Sandy ground and hedges; rather frequent; 3–5. The type (not recorded) has leaves much divided, with toothed lobes.

Var. *pinnatifida* Boiss. Leaves dentate or irregularly pinnatifid. III. i. Alcadeza Plains! Near Soto Gordo! Near Majarambout Woods! Cork Wood Crags!

Var. *frutescens* Boiss. More woody, leaves less cut. Var. *bætica* Boiss. hardly differs. I. *Schücht*! Rare, *K.* III. i. Frequent about San Roque, *K.* Alcadeza Plains! ii. Palmones Playazo! iii. Palmones Sands!

[*Anarrhinum laxiflorum* Boiss. was gathered by Reuter between San Roque and Grazalema, which is probably outside our limits. Debeaux cites it as "rocky hills of San Roque."]

A. bellidifolium Desf. Bushy hills; rare; 5–6. I. *Von Martius.* III. i. Sea-sand at foot of Fort S. Felipe, *D.* Pedrera, *D.* Alcadeza Crags!

[*Antirrhinum Linkianum* B. & R. is one of Gandoger's determinations from rocks in the neighbourhood of Gibraltar, *Dasoi.* Stem woody, leaves very broad, flowers bright purple. Probably an error.]

A. majus L. Rough bushy places; common on Rock, rare in

Spain; 3–6. I.! III. i. Alcadeza Crags! Valley near Long Stables! ii. Near Algeciras, *Née*.

Var. *ramosissimum* Wk. has many elongate flexuose branches; mixed with type and perhaps commoner. I.! III. i. Near San Roque, *D*.

†*A. tortuosum* Bosc. Similar places; frequent? 3–8. Much like last var., but wholly glabrous, leaves and sepals narrower. My only gathering for *A. majus* proved to be this. I. Both sides of Rock, *Reut.*, *Nilss*, &c. Below Mediterranean Road!

A. Orontium L. Fields and heathy places; common; 3–5. Very variable in leaves and flowers. I.! III.!

Var. *grandiflorum* Chav. has broad leaves and large flowers, often much branched. Common in Spain, rare on Rock. I.! III.!

†Var. *parviflorum* Lge. has flowers scarcely longer than calyx. III. i. San Roque, *D*.

Chænorrhinum villosum Lge. Rocks; locally frequent; 5–6. I.! III. i. Alcadeza Crags!

Var. *pusillum* Boiss. has very small leaves. I. *Winkl.*!

**Linaria Cymbalaria* L. On walls; occasional, but very doubtfully native, about the town and at San Roque!

L. cirrhosa Willd. Banks and rough places; rare; 5–7. Leaves narrow, sagittate, pedicels long, slender. Debeaux's notes after this species (Fl. p. 148), refer to *L. lanigera*, and possibly his San Roque stations refer to the latter also. I. *Brouss.*! III. i. About San Roque, *Brouss.*, *Pourr*. S. Carbonera, *Nilss*.

L. spuria Mill. Similar places; rare; 6–9. Calyx segments broadly oval, subcordate. III. ii. Near Algeciras, *Rev*.

Var. *racemigera* Lge. has very short pedicels and very small calyx segments. Perez Lara thinks it is synonymous with next. III. ii. Algeciras, *Rev*.

L. lanigera Desf. Similar places; rather frequent; 6–10. Very near last, but calyx segments narrow lanceolate. I. Abundant near messroom of South Pavilion, *K*., herb. Balestrino!; not there now, I think. Behind the Mount, *K*. II.! III. i. and ii.! seldom seen by me in flower, but I think frequent.

L. triphylla Mill. Cultivated fields; rare; 3–5. Annual, leaves large and broad, flowers whitish or yellowish, variegated with lilac. I. *Brouss.*! III. i. At foot of San Roque, *D*.

[*L. Clementei* Haens. a perennial, 3 ft. high, flowers violet with yellow palate, has been reported from Gibraltar by Dasoi.]

L. viscosa Dum. Sandy ground; common; 2–6. Tall, with large yellow flowers in a compact raceme, scarcely longer in fruit. Often misnamed *L. spartea* L., which has much longer pedicels in a lax raceme. I. *Lem.*!? I think this, but fruiting raceme elongate. III. i. and ii.! In profusion on mountains after a fire!

L. pedunculata Spreng. Sand-dunes; locally plentiful; 3–5. I.! II.! III.! From Catalan Bay to Sandy Bay beyond Algeciras! Flowers purple or yellow.

L. amethystea Hoffm. & Link. Sandy and gravelly places; locally common; 2–5. Flowers violet. III. i. Cork Wood and Alcadeza Crags!

Var. *albiflora* Boiss. has petals white, spotted with violet. I. Chiefly east side! III. i. Queen of Spain's Chair, rare!

L. Munbyana B. & R. Sandy places; occasional? 2–5. Very small, with yellow flowers, seeds with a thick wing. A species I believe to be this, frequent in the stations cited, has very dark seeds, with a dark, but scarcely thick wing. I have seen no other specimens, but all allied species have pale seeds, with a very pale diaphanous wing. III. i. Between Gibraltar and San Roque, *Schousb.* Beyond Second Pine Wood!? ii. Between M. de la Torre and Palmones Bridge!? iii. Palmones Sands!?

[*L. Haenseleri* B. & R., like last, but seeds with a very pale thin wing, is reported by Dasoi from the neighbourhood, but not confirmed.]

L. tristis Mill. Rocks; locally frequent; 3–6. Flowers varying from dingy yellow to reddish brown. I.! III. i. Alcadeza Crags! San Roque, *B. & R.*

L. melanantha B. & R. Rocks; rare; 3–6. Flowers almost black, but often drying quite pale, leaves narrow, ½ line or less, calyx segments narrower. Scarcely distinct from last. III. ii. Waterfall Valley!

Digitalis purpurea L. var. *tomentosa* Webb. Woods; locally frequent; 4–6. III. i. Almoraima! Mountain Woods at San Roque, *D.* ii. Mountains!

†*Lafuentea rotundifolia* Lag. Bushy rocky places; rare; 4–5; not found recently. I. *Brouss.*

Sibthorpia europæa L. Wet places in mountains; locally common; 5–9. III. i. Foot of Alcadeza Crags! ii. Reaching high up the slopes!

Veronica Cymbalaria Bod. Walls and stony places; very common; 1–4. I.! III.!

V. agrestis L. Sandy fields; rare; 12–3. Flowers axillary, pale, calyx-lobes oval, capsule notch narrow, valves 4–6-seeded. I. North Front, near Cemetery! III. ii. Algeciras Station!

†*V. persica* Pourr. Similar places; rare; 1–3. Much larger, flowers bright blue, capsule lobes broad, flattish, divaricate. III. ii. Palmones Playazo!

V. polita Fries. Grassy places; rather rare; 3–4. Flowers bright blue, calyx lobes broadly ovate, capsule notch broad, valves 7–10-seeded. III. i. Lajo River bed! Almoraima! ii. Algeciras Station!

V. arvensis L. Similar places; frequent; 2–5. Flowers minute, blue, in bracteate racemes. I. North Front! III. i. First Pine Wood! Cork Woods! ii. Algeciras Station! Mountains!

V. Anagallis L. Wet ditches; frequent; 4–6. A polymorphous species. Mr. Druce refers specimens from Lajo Valley to the segregate *V. aquatica* Bernh., known by its very spreading pedicels and broad capsules, not narrowed below. Type *V. Anagallis* L. has ascending pedicels and capsules narrowed below. I cannot say which form prevails. III.!

V. anagalloides Guss. Similar places; frequent in the

province; 4–6. Leaves and sepals narrower, capsule narrower, attenuate above. I have not identified it. II. *D.*

Eufragia viscosa Benth. Grassy places; common; 4–5. I. South and west slopes, *K.*, *D.* Signal Station! II.! III.!

Trixago apula Stev. Usually in drier places; common; 4–5. Flowers lavender and white. I. Breakneck Battery! Moorish Wall! II.! III.!

†Var. *lutea* Lge. has bright yellow flowers, known from *Eufragia* by its short broad sepals. I. East slopes Middle Hill! III. i. Rocky slopes of San Roque, *Wk.*, *K.*, *D.*

†*Bartsia aspera* Lge. Dry rocky places; locally frequent; 8–9. A Portuguese species, probably only a very scabrid form of the Pyrenean *B. spicata* Ram. III. ii. Tops of mountains! whence Reverchon records it.

Odontites tenuifolia Don var. *australis* Boiss. Dry bushy places; rare? 7–9. Very slender, flowers small, unilateral. The var. is a more glabrous form. III. ii. S. de Palma, *Rev.*

Orobanchaceæ.

In this difficult order I have, as a rule, only mentioned localities from which specimens have been named for me by Prof. Beck, as well as citing those already recorded. It might be misleading to give their apparent distribution, though several species are probably quite common.

Orobanche cernua Loefl. Apparently rare; 4–6. Corolla bluish, much deflexed, much constricted below mouth. III. ii. Near Algeciras, *Winkl.*

†*O. caryophyllacea* Sm. (*O. Galii* Vauch). Apparently rare; 3–5. Stout, corolla large and broad, wholly brown, stigmas brownish or violet. III. ii. S. de Palma in Los Barrios District, *Rev.*

†f. *macroglossa* Beck has corolla square in lateral aspect. III. i. Cork Wood Crags! (my 1669, pars, *teste* Beck). Confounded with *O. gracilis.*

†*O. Rapum-Genistæ* Thuill. Appears rare; 3–5. Larger than *O. gracilis*, with larger wider corolla, more uniformly brownish rose, not shining within? stigmas yellow. III. ii. S. de Palma, *Winkl.*, *Rev.*

O. gracilis Sm. (*O. cruenta* Bertol.). Rather frequent, at least locally; 3–6. Usually large, stout, corolla dull greenish yellow outside at base, reddish towards mouth, deep shining moroon inside, stigmas yellow. III. i. Queen of Spain's Chair! (*teste* Beck). ii. Frequent at the Waterfall! (*teste* Beck).

†f. *polyantha* Beck has smaller flowers in a longer spike. III. i. Cork Wood Crags! (my 1669, pars, *teste* Beck).

†Var. *Sprunneri* Beck (*O. reticulata* Beck, non Wallr.). Corolla larger, upper lip with broader lobes. III. Near Gibraltar, *Beck.* ii. Algeciras, *Beck.*

O. fœtida Poir. Either this species or the next often frequent in cornfields; 4–5. Corolla deep blackish crimson, 7–12 lines, filaments pilose below, inserted $1\frac{1}{2}$–$3\frac{1}{2}$ lines above base, stigmas described as yellow, but Prof. Beck thus names my specimens

with them deep red. I. *K.*, *D.* III. i. San Roque, *K.*, *D.* ii. Palmones Playazo, on *Ononis pinnata*! (my 1920, *teste* Beck). S. de Palma and S. de Luna, *Beck.*

†f. *pusilla* Beck is a reduced form. III. i. Second Pine Wood! (my 1978, *teste* Beck).

†*O. sanguinea* Presl. (*O. crinita* Viv.); 4–5. Like last, but corolla shorter, filaments subglabrous, inserted much nearer base, stigmas red. I. Bruce's Farm! (my 1958, *teste* Beck). On *Lotus*, *Salzm.* III. i. Algeciras, *Beck.*

[*O. reticulata* Wallr., recorded from the Rock by Lemann, and from San Roque by Dautez, is probably an error for *O. gracilis.* It is not known in S. Spain.]

O. crenata Forsk. (*O. pruinosa* Lap., *O. speciosa* DC.). On peas and beans; common, often a field full; 4–5. Tall, very stout, corolla large, lavender or bluish and white. I. Sand-pits! III.!

O. densiflora Salzm. Rare, or passed over for one of the other yellow-flowered species; 4–5. Flowers yellow, in a very dense spike, corolla 5–8 lines, bracts as long as corolla tube, filaments auriculately lobed at base. III. ii. Near Palmones and Algeciras, *Hack.*, *Winkl.* (*teste* Beck). Algeciras, *Rev.*

†*O. mauretanica* Beck. Rare; 5–6. Near last, but spike longer and laxer, flowers much larger, bracts as long as corolla, filaments not lobed at base. Usually wholly bright yellow, or with brown bracts and sepals, and corolla streaked brown. Stigmas yellow or pink. III. i. Between Sprague's Farm and San Roque! (my 1985, 1986, *teste* Beck). A specimen from I. Devil's Gap (my 1939) may be the same.

[*O. pubescens* D'Urv. (*O. versicolor* Schultz). A specimen at Kew, from Algeciras, so labelled by Winkler, is unnoticed by Beck, and is probably one of the other yellow-flowered species.]

†*O. loricata* Reichb. Rare; 5–6. Flowers yellow, filaments hairy at base, very glandular at apex, bracts longer than corolla, calyx segments deeply divided, stigmas pink. III. ii. Algeciras, *Rev.* (*teste* Beck).

†*O. Picridis* F. Schultz. Apparently rare; 5-6. Very near last, but filaments glabrous at apex, bracts as long as corolla, calyx segments bidentate to middle or less. I. Near Breakneck! (my 2118, *teste* Beck). A form near *O. Boissieri* Reichb. f., which is a step towards *O. amethystea* Thuill.

†Var. *Carotæ* Beck is a dense flowered form, with less glandular-pilose reddish violet bracts, and subglabrous corolla with violet veins. I. Gibraltar, *Beck.* III. ii. Algeciras, *Beck.*

O. minor Sutt. Occasional? 5–6. A most variable species. I. West slopes, *K.*, *D.* III. ii. Algeciras, *Rev.* (*teste* Beck).

f. *concolor* Beck (*O. concolor* Duby) is a wholly yellow form. III. iii. Sands at Guadacorte! (my 1913, *teste* Beck).

[*Phelipæa cærulea* C. A. Mey (*O. cærulea* Vill.) recorded by Kelaart from the Rock is unknown in Spain.]

[*P. ramosa* C. A. Mey. (*O. ramosa* L.) also recorded from Gibraltar by Kelaart is not known in the South of Spain.]

P. Muteli F. Schultz. Apparently frequent; 3–5. I. Gibraltar, *Beck*. III. i. San Roque, *Beck*. ii. Algeciras, *Beck*.

†*P. nana* Reichb. f. Rare? 4–5. Like last, but corolla shorter, segments of lip more acute, tube less constricted in middle. III. i. Cork Wood Crags! (my 1736, *teste* Beck).

Labiatæ.

Lavandula Stœchas L. Dry bushy hills; rare in Gibraltar, abundant in Spain; 2–6. Leaves quite entire. I. South and west slopes, *Tournef.*, *Schott*, *K.*, *D.* III.!

†*L. dentata* L. Similar places; common on Rock, rare in Spain; 11–4. Leaves dentate. I. Chiefly above Alameda and above Levant, but frequent elsewhere! A whitish-flowered form occurs near Jews' Cemetery! III. i. San Roque, *D.*? Not confirmed.

L. multifida L. Similar places; common on Rock, rare in Spain; 11–4. Leaves pinnatifid. A white-flowered form is found. I.! III. i. Near San Roque, *Boiss.*, *Pourr.*

Mentha rotundifolia L. Damp grassy places; very common; 6–8. I. North Front, *K.* A few plants above Devil's Gap! II.! III.!

†Var. *macrostachya* W.-Dod (*M. macrostachya* Ten.) has shorter denser spikes. III. ii. Algeciras, *Rev.*

†*M. Bauhini* Ten. Similar places; rare; 6–8. Taller, less tomentose, spikes very dense, short and acuminate, many in a lax panicle. Perhaps only a variety of last. III. ii. Algeciras, *Rev.*

†*M. aquatica* L.? Similar places or in water; rare; 7–9. Debeaux throws doubt on the occurrence of this species, and Perez Lara does not record it, but I have seen leaves of what appears to be a glabrous form in the stations cited. III. i. In the Lajo at First Pine Wood!? ii. Near Arroyo Gaba!? Slopes south of Algeciras!? iii. In a copse at Guadacorte!?

M. Pulegium L. var. *villosa* Benth. Grassy places; very common; 6–9. Young leaves and shoots usually quite glabrous, but flowering stems almost always very tomentellous. I. North Front, *K.*, &c., not there now. II.! III.!

Lycopus europæus L. Streams and marshes; locally rather frequent; 6–9. III. i. Cork Wood Sotos! ii. Mountains! iii. Guadacorte!

Origanum virens Hoffm. & Link. Dry banks; rare; 6–8. III. ii. S. de Palma, *Rev.*

O. compactum Benth. Dry places; rare; 6–8. Differs from last in narrower more glandular bracts, and perhaps only varietally distinct. III. i. Road to Malaga Gardens! Between San Roque and First Pine Wood!

Thymus hirtus Willd. Rocks and walls; rare? 5–7. Much confused with next, and Mr. A. B. Jackson is of opinion that all he has seen so labelled from the Rock belongs to that species. Willkomm suggests that it may be a variety of *T. vulgaris*. The distribution of our species requires further investigation. I. *Boiss.*, *D.* III. i. Carteian Hills, *K.* ii. Waterfall Valley? not seen in flower.

†*T. diffusus* Salzm. Similar places; common on the Rock; 5–7. Differs from last chiefly in narrower floral leaves, though in Masson's specimen, cited as typical, as well as in all I have examined, they are twice as broad as cauline. I.!

†*T. vulgaris* L. Similar places and rough ground; rare? 5–7. Cauline leaves much broader and flowers pedicelled. I. *Gaudichaud*. III. i. Carteian Hills, *Von Martius*, *K*., and others.

†Var. *capitatus* Wk. has capitate inflorescence. I. *Rev*. My 917 from Moorish Wall near Middle Gate closely resembles this, but Mr. Jackson thinks it is only a form of last with lax branches and broader leaves.

Coridothymus capitatus Reichb. f. Dry hills; locally abundant; 5–9. I. *Gaudichaud*. III. i. North and West of San Roque!

†*Micromeria græca* Benth. Dry bushy places; frequent; 4–6. Only the variety is recorded by Debeaux, though the type seems equally frequent. I.! III. i. and ii.!

Var. *latifolia* Boiss. has leaves as broad as those of next. I.! III. i. and ii.!

M. nervosa Benth. Similar places; rare; 5–6. Inflorescence much denser, calyx very villous, teeth more spreading. III. i. By Pedrera, *D*.

Satureia inodora Salzm. Dry heathy hills; rare; 6–7. Rather like *Coridothymus*, but much more lax and straggling, with much laxer inflorescence. III. i. Top of Queen of Spain's Chair! ii. Cuartel de las Corzas, *Laguna*. S. de Palma, *Rev*.

[*Calamintha Nepeta* Savi (*Melissa Nepeta*) is recorded by Boissier and Kelaart from Gibraltar. It differs from next, which is often mistaken for it, in its subequal calyx teeth, throat hairs exserted, and smaller corolla.]

C. menthæfolia Host. (*C. officinalis* Benth.) var. *bætica* Ball. Similar places; locally abundant; 6–12. Lower calyx teeth much the longest, throat hairs included. The variety is more densely white tomentose, and more branched, with larger corolla, but scarcely differs from type, which is abundant elsewhere in the province. I.! III. i. Cork Woods! ii. Waterfall Valley!

C. Clinopodium Benth. Woods and bushy places; rather rare; 5–6. Our form seems to be var. *pterocephala* P. L., with long plumose calyx. III. i. Almoraima Soto! ii. Waterfall Valley!

Melissa officinalis L. var. *villosa* Boiss. Similar places; locally frequent; 6–7. The variety is a more villous form. III. i. Almoraima!? leaves only. ii. Waterfall Valley!

Rosmarinus officinalis L. Bushy and rocky places; rather rare; 11–5. I. Mediterranean Steps and Road! Near Signal Station! III. i. Cork Wood Crags!

Salvia triloba L. † var. *calpeana* Daut. & Deb. Rocky bushy places; very rare; 5–6. Shrub, 5–6 ft., leaves narrow, entire, wrinkled, some (very few in the only bush I have seen) with a pair of leaflets at base. Differs from type in being twice as large, with longer laxer spikes, and broader much less tomentose leaves. The entire-leaved form, var. *integrifolia* Rev., hardly differs from

S. officinalis, except in being shorter, with shorter, broader, less acuminate calyx teeth. I. About Ince's, apparently cultivated! Dautez describes the station as "rocks on west slopes," and Debeaux adds, "the indigeneity of this plant in the rocky and elevated ravines could not be doubted," so it doubtless occurs elsewhere, though I have repeatedly searched in vain for it. Colmeiro thinks it not native.

[*S. officinalis* L., *S. hispanica* L., and *S. viridis* L., are reported by Kelaart and Gaudichaud from the Rock. None is probable but *S. lavandulæfolia* may have occurred formerly.]

[*S. rotundifolia* is mentioned by Kelaart as found by San Roque road. There are three species of that name, none of them Spanish.]

†*S. Sclarea* L. Rough slopes; rare; 5–6. Leaves broad, subcordate, bracts very broad, strongly veined, flowers pale blue. III. ii. Near a cottage in valley above Frayle Bay!

S. tingitana Etth. Bushy places; rare; 5–6. III. Neighbourhood of Gibraltar, *Rouy*.

S. bicolor Desf. Banks of streams; locally frequent; 5–6. Very showy, often 3–4 ft. high, with large lavender flowers. [I. Communicated to Kelaart.] III. i. By Cagancha! Arroyo Viejo! Near Malaga Gardens! Towards Alcadeza Crags! iii. Mr. Patron informs me that it occurs with white flowers behind Guadacorte.

S. bullata Vahl. (*S. bætica* Boiss.). Dry banks; rare? 4–6. Leaves rather large, ovate lanceolate, bullate, flowers fuscous red. III. i. Cork Woods, *Boiss.*, *Schousb.* San Roque Road, *K.* Plentiful near Almendral, *K.*

S. Verbenaca L. Dry banks; common; 12–6. Corolla usually pale, rarely dark blue, much longer than calyx, upper lip much arched. Inflorescence very glandular, often short and dense. I. Chiefly lower Rock! III. i. and ii.!

Var. *præcox* Lge. (*S. clandestina* L.). Debeaux evidently uses this name for the next species, but according to Mr. Pugsley (Journ. Bot. 1908, p. 144) it stands for dwarf forms of *S. Verbenaca*. III. i. and ii.!

†*S. horminoides* Pourr. (non G. & G.). Similar places; common; 12–6. Always tall and eglandular, corolla much darker and smaller than last, upper lip scarcely arched. III. i. and ii.!

Nepeta tuberosa L. Rough bushy places; occasional; 5–7. Floral leaves and bracts quite herbaceous, not pellucid, reticulate-veined. I. By wall from Middle Gate to Signal Station! Near Farringdon's! Mediterranean Steps, a single plant! III. i. Malaga Gardens!

N. reticulata Desf. Similar places; rare or error? 7–8. Near last, but bracts submembranous, pellucid. I. *Clem.*?

N. Apulei Ucr. Similar places; rare; 4–6. Much more glabrous, floral leaves and bracts narrow, herbaceous, nerves strong, not reticulate. III. i. Near San Roque, *D.*

Lamium amplexicaule L. Chiefly in vegetable gardens; rather

frequent; 2–5. I. Everywhere, *D.*, where I have not seen it. III. i. Cork Woods, far from cultivation! ii. and iii.! Pelayo!

L. flexuosum Ten. Woods; rather rare; 4–6. Closely resembling *L. album*, but lower lip of corolla with one, instead of 2–3 teeth, anthers glabrous, not bearded. III. i. About Almoraima! ii. Waterfall Valley!

Stachys germanica L. var. *lusitanica* P. L. Bushy hills; very common; 4–6. The local form of this polymorphous species does not vary much. It differs from type in its oblong cordate leaves, obtusely crenate, indumentum more tomentose, less silky, and flowers whitish, not purple. I. Above Engineer's Road! III.!

Var. *interrupta* Rouy, with whorls more distant than in type, seems hardly worth distinguishing. It is mixed with type everywhere. III.!

S. circinnata L'Hérit. Rocks; locally rather frequent; 4–5. I.! Not confined to south and west, as Debeaux says.

S. arvensis L. Fields and bushy ground; very abundant; 1–5. Occasionally with pure white flowers. III.!

S. hirta L. Chiefly in fallow fields; abundant; 4–6. I. Near Jews' Cemetery! Mediterranean Steps! A casual on Line Wall! North Front, *Frere*. II.! III.!

Betonica algeriensis De Noë. Mountain slopes; locally common; 5–7. A good species, I think. Inflorescence subspicate rather than capitate, flowers much smaller and paler than in *B. officinalis*, dingy pink, bracts and sepals often glandular punctate. III. i. Queen of Spain's Chair! ii. Mountains!

Ballota hirsuta Benth. Rough bushy places; rare; 5–6. I. Roadside above Willis's! South and west slopes, *D.*

Phlomis Herba-venti L. Bushy places; locally common; 5–6. III. i. Roadsides and fields towards S. Lorca! ii. Woods behind Algeciras, *K.*

P. purpurea L. Bushy places; abundant; 3–6. I.! III.! With pure white flowers on the Rock and near M. de la Torre!

†*P. fruticosa* L. Similar places; now extinct? 3–6. I. *Tournef.*, *Gaudichaud*, *K.*

P. Lychnitis L. Dry and stony places; rare; 5–6. Flowers yellow. III. i. South slopes of San Roque, *D.*

Marrubium vulgare L. Waste places near buildings; rather frequent; 4–7. I. Below Signal Station! Windmill Hill! Catalan Bay! III.!

Sideritis scordioides L. var. *Cavanillesii* Wk. Rocky places; rare; 4–7. Near next, differing mainly in calyx teeth with long spines, often spreading. I. *Masson*, *Martius*, *Link.*, teste *Wk.* Kelaart and others record the next species under this name.

†*S. arborescens* Salzm. Rough bushy places; occasional; 4–5. I. Levant! Near Queen's Gate! Engineer Road! Described as 4–5 ft. high; I have never seen it more than 2–3 ft.

S. angustifolia Lam. Similar places; rare; 5–6. Much more slender and elongate, less shrubby, with a more spinose calyx and narrow entire leaves. III. i. Plain below Malaga Gardens! a very glabrous form.

S. romana L. Dry and rocky places; rare; 4–5. Annual, with white flowers, floral leaves like cauline. III. i. S. Carbonera and San Roque, *D.*

Cleonia lusitanica L. Rough slopes; occasional; 5–6. III. i. Beyond Pedrera! Path to First Pine Wood! Pine Wood Plains! Alcadeza Crags! ii. Algeciras, *Frere.*

Prunella vulgaris L. Damp marshy places; frequent; 4–6. III. i. Almoraima Soto! By Lajo! ii. Mountains! Carnero Hills! iii. Guadacorte Marsh!

†*Prasium majus* L. Rocky places and old walls; very common on Rock, rather rare in Spain; 4–6. I.! III. i. At Carteia! ii. Old walls at Algeciras! Carnero Hills!

Ajuga Iva Schreb. Dry hills; rather rare; 3–7. III. i. Carteian Hills! ii. Near Sandy Bay! iii. Guadacorte!

Var. *pseudo-Iva* Benth. with yellowish, not rose flowers, and more revolute leaves. Much commoner than type, and usually cleistogamous. I. Near Willis's! III. i. and ii.!

†*Teucrium campanulatum* L. Rare; 5–7. Leaves subbipinnatifid. III. ii. Near Algeciras, *Née.*

T. fruticans L. Bushy places; chiefly in woods; common; 2–5. I.! III. i. and ii.!

†Var. *latifolium* Rouy, with larger broader leaves, subvillous above. I. *Wk.*, *K.*, *D.* III. i. S. Carbonera, *D.* ii. S. de Palma, *Rev.*

†Var. *rotundifolium* Daut. & Deb. Leaves shorter, broader, half the size, roundish ovate, green above. I. III., i. and ii. Same collectors.

†*T. bracteatum* Desf. Dry grassy hills; rare; 6–7. Whorls several-flowered, not secund, bracts ovate lanceolate, longly petiolate, calyx segments subequal, flowers pink. A Moroccan species, reported from Tarifa according to Ball, but not recently found. III. ii. Ridge between Carnero and Pelayo!, dwarf specimens in an exposed situation.

T. Scorodonia L. Bushy and rocky places in mountains; locally common; 5–7. The type is subglabrous and eglandular. III. ii. El Cobre, &c.! Other examples from Waterfall Valley have a more or less glandular-ciliate calyx, but are best under type.

Var. *bæticum* P. L. Inflorescence very glandular, corolla tube shorter. I. *Brouss.*!, *Salzm.*, *Durand*, *&c.* III. i. Queen of Spain's Chair! Alcadeza Crags! ii. Mountains!

Var. *pseudo-Scorodonia* P. L. Leaves longer, less deltoid, whitish-tomentose beneath. I. Rare, *K.* III. i. Queen of Spain's Chair!

T. resupinatum Desf. Cultivated fields; frequent or common; 5–6. Leaves dentate or subentire, corolla resupinate. III. i. and ii.!

T. scordioides Schreb. Marshy spots; very local; 7–8. III. iii. Palmones Sands! Thicket near Guadacorte!

†*T. lucidum* L. Rough slopes; rare; 6–7. Aspect of *T. Chamædrys* L., but quite glabrous, with shining leaves. I.? Between Old Man's Garden and Engineer's Road, *Robinson.* Not confirmed.

T. Polium L. Rough bushy places; locally common; 4–7. I.! III. i. Cork Wood Crags! Near Malaga Gardens!

Var. *aureoforme* Rouy has yellowish tomentum. Debeaux says he has submitted specimens from the Rock to M. Rouy, who says they are not *T. aureum* Schreb., as at first supposed. I. Near Middle Gate of Charles the Fifth's Wall!

Verbenaceæ.

Verbena officinalis L. Waste places; frequent; 5–10. I. Not common, *K.* II. Frequent, *K.* III.!

V. supina L. Similar places; rare; 4–6. II. *D.* III. i. Sand desert, *D.* ii. One or two places in Algeciras!

Vitex Agnus-castus L. Sandy ground; occasional; 7-8. II.! III. i. Near Agua Mayorga, *D.*, *Boiss.* Lane to First Venta! Almoraima! Towards S. Lorca! ii. Near Algeciras and El Saladillo! Arroyo Gaba!

Acanthaceæ.

Acanthus mollis L. Bushy places; abundant on dry limestone on the Rock, and by watercourses in Spain, very rarely dry places; 4–6. I.! III.! Long Stables Ravine and Alcadeza Crags are the only dry spots in which I have seen it.

Lentibulariaceæ.

Pinguicula lusitanica L. Stream beds; locally frequent; 4–7. III. i. East slopes Queen of Spain's Chair! ii. Mountains!

Primulaceæ.

Coris monspeliensis L. Sandy places; locally frequent; 3–6. III. i. Cork Wood Crags! Alcadeza Crags! S. Carbonera and San Roque, *D.*

Lysimachia Ephemerum L. Damp bushy places; locally frequent; 6–7. III. i. Almoraima Soto! iii. Guadacorte Marsh!

Asterolinum stellatum Hoffm. & Link. Dry hills and mountains; common; 3–4. III. i. Queen of Spain's Chair! Bonel's Farm! About San Roque! Cork Woods! ii. Mountains!

†*Centunculus minimus* L. Damp grassy places; rare; 4–6. III. i. Near San Roque, *Ball*! ii. Near Algeciras, *Nilss.*

Anagallis crassifolia Thore. Marshy places; locally frequent; 4–6. Flowers white. III. i. Near top of Queen of Spain's Chair! Alcadeza Crags! ii. Mountains!

A. arvensis L. Dry hills and fields, tilled and native; common; 2–5. Flowers red. I. *K.* II.! III.! With pale pink flowers (var. *carnea* Schr.) behind Algeciras engine shed!

A. cærulea Lamk. Similar places; abundant; 2–5. Flowers blue. Varies greatly in size, the small-flowered forms may be *A. parviflora* Hoffm. & Link. I.! II.! III.!

Var. *latifolia* Lge. is larger, stouter, leaves broadly ovate, subcordate, semiamplexicaul, calyx segments longer and broader. Frequent on Rock. Perez Lara says it is commoner than type in province, but I have not found it so. I.! III.!

†*A. platyphylla* Baudo. Similar places; rare; 5. Annual, like last, but flowers 1½ in. diameter, leaves 1 in. broad. III. i. Rocky grassy places on south slopes of San Roque, *D.*

A. linifolia L. Sandy places; locally frequent; 4–6. Perennial, leaves linear or narrow lanceolate, flowers very large. I. *Masson, Finlay*!, *B. & R.* II. *D.* III. i. Alcadeza Crags and Plain! Cork Wood Crags! ii. Palmones Playazo! iii. Palmones Sands!

Samolus Valerandi L. Wet places; frequent; 4–9. I. Caves at Europa Point, *K.* Rocks over North Front, *D.* II.! III.!

Plumbaginaceæ.

Armeria macrophylla B. & R. (*A. bætica* var. *stenophylla* Boiss.). Heathy places; locally frequent; 4–6. Leaves long, very slender, in dense tufts, calyx lobes truncate, mucronate. I.? *Finlay*! *Willd.*, teste *Wk.*, *Masson.* III. i. Cork Woods! Pine Wood Plains!

A. bætica Boiss. Grassy places; locally frequent; 3–6. Leaves shorter and broader, calyx lobes acuminate, cuspidate. III. i. Bonel's Farm! Linea and Campamento, *Frere.* ii. and iii.!

Var. *hirta* Boiss. has leaves and calyx ribs more hirtulous. II. or III. i. Sands near Gibraltar, *Willd.*, *D.* ii. Sandy Bay!?

Statice ferulacea L. Salt marshes; locally frequent; 5–7. Leafless, flowers at ends of branches, outer bracts and calyx longly aristate. III. i. Rare on Bonel's Farm! ii. Algeciras, *Rev.* iii. Guadarranque Marshes! Aguacorte!

S. diffusa Pourr. Similar places; rare; 6–7. Like last, but flowers fewer, at base of branches, bracts and calyx not longly aristate. III. ii. Near Algeciras, *Nilss.* iii. Palmones, *Nilss.*

S. virgata Willd. Similar places; rare or error? 6–10. Leaves narrow spathulate, panicle with many barren branches. I. Sands and rocks by shore, *Laguna*? Possibly the next mistaken for it.

S. spathulata Desf. var. *emarginata* Boiss. Rocks by shore; locally abundant; 5–6. Dense tufts of rigid spathulate emarginate leaves, no sterile branches. I. From Europa Point to Monkey's Cave! Beyond Catalan Bay! III. ii. Algeciras, *Rev.*

S. lychnidifolia Gir. Muddy salt marshes; locally common; 5–6. Radical leaves few, large, oblanceolate. III. i. Above Guadarranque Ferry! ii. Palmones Playazo! iii. Guadarranque Marshes! Recorded by Née as *S. ovalifolia* Poir.?

S. sinuata L. Sandy slopes and rocks near sea; locally common; 4–6. I. Europa Point to Governor's Cottage! III. i. Sands at foot of S. Carbonera, *Wk.* ii. Algeciras, *Rev.*

Plantaginaceæ.

Plantago Psyllium L. Dry slopes and fields; very common; 3–5. The common form is var. *dentifolia* Wk., with broader leaves, with 2–3 rather long teeth each side, but I think the type with entire or denticulate leaves also occurs. I.! II.! III.!

P. amplexicaulis Cav. Similar places; rare; 3–6; Annual, stems 1–4 in., leaves mostly basal, linear lanceolate, petioles short,

broadly amplexicaul, and large subglabrous flowers. III. ii. Algeciras, *Winkl.*

[*P. Lœflingii* L. was reported in error to Kelaart from the Rock.]

P. Lagopus L. Similar places; frequent; 4–6. Like *P. lanceolatum* but annual, with very longly villous calyx. Var. *lusitanica* Ball differs chiefly in the quite unimportant character of taller scapes, and is inseparable from the type. I. Windmill Hill!, and elsewhere in the south, *Deb.* III. i. San Roque, *D.* ii. Near Algeciras, *Nilss.* iii. Near Los Barrios Station!

Var. *vaginata* W.-Dod (*P. vaginata* Vent. Jard. Cels. t. 29) has a long stem sometimes 1 ft. high. It is as common as type or var. *lusitanica*, and is connected by every intermediate. I.! III.!

P. lanceolata L. Grassy places; frequent? 3–5. Perennial, corolla and calyx glabrous. II.! III. i. Opposite Francia's Farm and elsewhere! ii. About Algeciras! Carnero Hills! The form is usually var. *eriophylla* Dcsne., but I have seen type.

P. Bellardi All. Dry sandy places; very common: 4–5. A low annual, with short thick spikes and grey pubescent leaves. I. Willis's! South and west slopes, *K.*, *D.* III. i.!

P. Serraria L. Rather damp clayey soil; abundant; 4–5. Leaves bright green, glabrous, remotely coarsely dentate, spikes long, cylindrical. I. Windmill Hill! II.!? III.!

†*P. maritima* L.? Salt marshes; rare; 4–5. Leaves very narrow, usually entire, capsule 2-seeded. III. iii. My 2060 from near Los Barrios Station may be this, but the leaves are rather broad and have one or two teeth, the capsule is 2-seeded, but this sometimes occurs in *P. Serraria.*

P. Coronopus L. Sandy ground; abundant; 1–12. Fairly constant in character in our region. I.! II.! III.!

Var. *crithmifolia* Wk. (*P. Ceratophyllum* Hoffm. & Link.) is larger, with bipinnatifid leaves, and a broader rachis. I. Catalan Bay! Sentry Fence! Governor's Cottage!

P. major L. Chiefly in vegetable gardens; occasional; 3–9. I. *K.* III.!

[Nyctaginaceæ.]

[*Mirabilis Jalapa* L. is more or less established above Devil's Gap, at Sandpits, and in gardens.]

Amaranthaceæ.

Amaranthus albus L. Roadsides and gardens; occasional; 6–9. Pale green, with sessile axillary spiny clusters. III. i. Near Punta Mala! Railway near Second Venta! A weed of cultivation elsewhere!

A. Blitum L. Similar places; rare; 5–9. I.? "Gibraltar," *Brouss.* without precise locally, but perhaps not on the Rock.

A. chlorostachys Willd. Waste and cultivated soil; rare; 12–5. Dark green, with dense terminal and lateral spikes, floral bracts spinose. III. i. Gardens at First Venta! ii. Algeciras Station!

A. deflexus L. Similar places; frequent; 1–12. Prostrate, with short axillary and terminal spikes, bracts muticous. Leaves

often blotched with white or black as in *A. Blitum*. About the Town and at South Barracks! II.! III. i. River bed at Almoraima! Campamento! ii. Algeciras Station, &c.!

†*Achyranthes argentea* Lamk. Grassy bushy places; local; 3–6. I. Above Alameda Parade! Below Mediterranean Tunnels! Monkey's Cave! Dockyard! Sandpits! Above Catalan Bay!

**Alternanthera Achyrantha* R. Br. By walls and waste places; rare; 7–10. Clusters axillary, silvery white. I. *Haensl.* III. ii. Algeciras, *Rev.*

*†*Pupalia atropurpurea* Moq.-Tand. Similar places; rare; 5–6? Inflorescence spicate, in distant globose, woolly spiny clusters. III. ii. Algeciras, *Rev.*

Chenopodiaceæ.

Salsola vermiculata L. Salt marshes; locally frequent; 6–9. Shrubby, with white stems. A glabrous form, probably var. *microphylla* Moq.-Tand., but erect, not prostrate. III. iii. Guadarranque Marshes!

S. Kali Ten. In deep sand on or near the shore; very common; 6–9. I. Near Lighthouse! II.! III.!

Var. *rosea* Moq.-Tand. Glabrous, purplish, wings of perianth rosy. II. *K.*, *D.* III. i. Sand Desert, *K.*, *D.*

S. Soda L. Sandy places near sea; rare; 7–9. I. *Gaudichaud.* III. ii. Marsh at Palmones Playazo! iii. Guadarranque Marshes!

Halogeton sativus Moq.-Tand. Salt marshes; rare; 7–9. Like a *Suæda*, but with long, membranous, spathulate perianth segments. I. *K.*

Suæda maritima Dum. Salt marshes and sands near sea; occasional; 7–10. I. By Inundation! Europa Point! II. *K.*, *D.* III. ii. Algeciras, *K.*, *D.* iii. Palmones Marshes! an erect form, subwoody below, but apparently annual.

S. fruticosa Forsk. Similar places; rare; 5–11. I. Rocks below Europa Point! Probably the plant which Kelaart thought might be *S. maritima* var. *salsa* Moq.-Tand., but quite suffruticose.

[*Salicornia fruticosa* L. is recorded from Neutral Ground and Algeciras by Kelaart and Dautez, but almost certainly in mistake for the next.]

Arthrocnemum macrostachyum Mor. & Delp. Salt marshes; locally abundant; 1–12. Each flower in a cup-shaped receptacle in one excavation of rachis, not each naked in a separate receptacle. II. *K.*, *D.*? III. ii. Palmones Playazo! iii. Guadarranque Marshes! Varying greatly in size and colour. Young plants have the appearance of *S. herbacea*.

Kochia scoparia Schrad. Salt marshes; rare; 9–10. III. ii. Near Algeciras, *Née*.

Obione portulacoides Moq.-Tand. Salt marshes and waste places near sea; rather rare; 8–10. I. Reclamation Road! III. ii. and iii. Palmones River and Marshes!

Atriplex Halimus L. River banks and near sea; local; 8–9. III. i. By Lajo between the fords! ii. Common on sandy shore hills at Algeciras, *Rev.*

A. hastata L.? Roadsides and waste places; common; 7–9. Only seen in young state. I. Governor's Cottage and elsewhere! II.! III.!

A. angustifolia Sm. Similar places; rare; 7–11. III. i. Railside about San Roque Station! iii. Palmones Marshes!

*†*Roubieva multifida* Moq.-Tand. Sandy places near sea; abundant, at least locally; 8–10. I. Rosia! North Front! II.! III.!

Chenopodium ambrosioides L. Roadsides and waste places; rather frequent; 6–11. The plant has a strong aromatic smell, and varies much in leaf cutting. I. Rosia! Reclamation Road! II.! III. i. Almoraima Station! First Venta! Towards Bonel's Farm! ii. Algeciras Station and elsewhere!

†Var. *pinnatifida* Wk. has pinnatifid leaves. III. iii. By Guadacorte Farm!

C. album L. †var. *paganum* Reichb. Cultivated and waste places; rather frequent; 6–10. Leaves narrowed below, panicle lax, racemes spicate, seeds acutely keeled. I. Very common, *K.*, *D.* I have only seen a plant or two at Sandpits! III. i. Campamento! First Pine Wood, &c.! ii. Algeciras Station! Palmones Playazo! iii. Salt Pans!

C. opulifolium Schrad. Similar places; rather frequent; 6–10. Leaves shorter, broader, even upper not narrowed at base, seeds with a thick obtuse keel. It is more general than my stations show. I. Reclamation Road! III. i. Cachon!

C. murale L. Similar places; common; 1–12. Shorter, denser, much more leafy, leaves often shining, strongly sinuate-lobed. I.! III.!

C. Vulvaria L. Roadsides and waste places; rare; 6–10. Small, prostrate, with a very fœtid odour. III. i. Beyond Campamento! ii. Algeciras Station!

[*C. Bonus-Henricus* L., communicated to Kelaart, was doubtless an error.]

Beta maritima L. Cultivated fields, roadsides, &c.; common; 4–6. I.! II.! III.!

†Var. *erecta* G. & G. A strict erect form, with leaves mostly cordate, appears to correspond with this variety. I. Europa Glacis!

[PHYTOLACCEÆ.]

[*Phytolacca dioica* L. is often planted, and *P. decandra* L. is half naturalized in old gardens.]

POLYGONACEÆ.

Emex spinosa Campd. Waste places; common; 2–4. I.! II.! III. i. and ii.!

Rumex crispus L. Ditches and damp places; rather frequent; 4–6. Panicle close and dense, leaves narrow, undulate, perianth segments rather large, entire. I. About the forts, *D.* III.!

R. conglomeratus Murr. Similar or drier places; rather common; 5–6. Panicle laxly branching, leaves narrow, flat, perianth segments small, entire. II.! III.!

†*R. Friesii* G. & G. Damp grassy places; rare? 5–6. Panicle much as last, perianth segments spinose-dentate. III. ii. S. de Luna in Los Barrios district, *Nilss.*

R. pulcher L. Dry gravelly and sandy ground; common; 4–6. Panicle divaricately branched, leaves panduriform, perianth segments spinose-dentate. I. Near Farringdon's! Governor's Cottage! II.! III.!

R. bucephalophorus L. Chiefly cultivated fields; very abundant; 4–5. I.! III.!

†Var. *perennans* Wk. is a perennant form. I. II. or III. Mobile sand at Gibraltar, and grassy places in the Bay, *Wk.* II. *D.* III. i. Sand desert, *K.*, *D.*

†*R. thyrsoides* Desf. (*R. intermedius* Guss., non DC.). Sandy and waste places; rather frequent; 4–5. Panicle dense, leaves lanceolate, fruit perianth large, entire. I.! III. i. Carteia! Alcadeza! ii.! iii. Salt Pans!

[*R. intermedius* DC. non Guss. has quite linear leaves, and a lax panicle. A specimen from San Roque so labelled by Ball is *R. thyrsoides.*]

R. tingitanus L. In deep sand; rather local; 4–5. Leaves triangular hastate, often crenately incised. I. *Boiss.* II. *D.* III. i. Linea! Puente Mayorga! ii. Palmones Playazo! iii. Palmones Village!

†*R. scutatus* L. Rocky and stony places; rather rare; 4–5. I. Slopes over Europa! Rocks below Europa Point! Devil's Gap! III. ii. Railway near Algeciras!

†Var. *glaucus* DC. non Boiss. is a very glaucous form, but not otherwise differing from type, with which it grows on the Rock!

Var. *induratus* Ball is very glaucous, the branchlets becoming indurated and spinescent, and outer perianth segments more reflexed. I. Rocks at Europa Point, *K.*, *D.*? I think it probable that var. *glaucus* DC. has been mistaken for it.

Polygonum equisetiforme Sibth & Sm. Sandy ground near sea; rare; 6–10. 3–4 ft., stem thick and woody, branches erect and virgate, or sometimes drooping, inflorescence leafless. III. i. Almendral! Guadarranque Ferry! ii. Palmones Playazo! iii. Palmones Village! Guadacorte Marshes!

P. maritimum L. Deep sand near the sea; occasional, formerly frequent; 4–11. I. North Front Sentry Fence! Catalan Bay! II. *K.*, *D.* III. i. Linea, *K.*, *D.* ii. Algeciras, *Née.* iii. Palmones, *K.*, *D.*

P. aviculare L. Waste and cultivated ground; common; 4–11. Varies less than in Britain. I think var. *agrestinum* Jord. is common, and var. *arenastrum* Jord. less so. I. North Front! Reclamation Road! III.!

P. Roberti Lois. (*P. Raii* Bab., *P. aviculare* var. *vegetum* Ledeb.?). Waste and sandy ground; frequent; 4–11. I retain this name to cover a species otherwise resembling *P. Raii*, but much stouter, and obviously perennial, with a thick woody stem. It is sometimes so large as to resemble *P. equisetiforme*, though usually

prostrate, and with quite different inflorescence, but I fear I may have sometimes confounded the two. II. Neutral Ground! III. i. Roadside just beyond Campamento, and many other places!

P. Hydropiper L. Marshy places; locally frequent; 7–10. Racemes lax, rather nodding, taste biting. III. i. Cork Wood Sotos! ii. By Miel from source almost to Algeciras!

†*P. serrulatum* Lag. By streams; rather frequent; 1–12. Racemes erect, compact, flowers pink. III. i. By Lajo and its branches! Cork Wood Sotos! ii.!

P. Persicaria L. Vegetable gardens; occasional; 5–7. Racemes dense, rather short, many fruits trigonous. III. i. Near First Venta! ii. Palmones Playazo! Algeciras, *Rev.*

P. lapathifolium L. Similar places; rare; 5–7. Racemes larger and denser, fruits lenticular. III. i. Almoraima!

[*P. Convolvulus* L. Cultivated ground? casual; 6–9. I. *Lag.* Found by no other collector.]

THYMELACEÆ.

Daphne Gnidium L. Bushy places; common; 6–10. I.! III.!

D. Laureola L. var. *latifolia* Coss. Woods; rare; 2–5. III. ii. Summit of Waterfall Valley! S. de Luna in Los Barrios district, *Laguna*. This may be the same station.

Thymelæa canescens Endl. Heathy hill slopes; locally common; 1–4. An erect, branched shrublet, leaves densely white-tomentose, flowers in small clusters, perianth lobes much shorter than tube. I.? *Brouss.*! III. i. From Pedrera to Majarambout Crags! Near First Pine Wood!

T. villosa Endl. Similar places, and in mountains; rather frequent; 5–6. Diffuse, greyish hirsute, flowers solitary, axillary. I. *K.* II. Abundant, *Boiss.*, *Juss.*, *K.* Not there now. III. i. With last! ii. Mountains to summits!

T. hirsuta Endl. Similar places; rare; 10–4. A tall shrublet, with densely imbricate white-woolly leaves, corolla lobes as long as tube. II. *D.*, not there now. III. i. Linea and S. Carbonera, *K.*, *D.*

LAURINEÆ.

Laurus nobilis L. Mountain valleys; locally abundant? 3–4. III. ii. S. de Palma, *Wk.*! I have not seen this in flower or fruit, but think I have seen leaves in several places.

SANTALACEÆ.

Osyris lanceolata Hochst. (*O. quadripartita* Salzm.). Rocks and bushy slopes; common on Rock, rare elsewhere; 5–6. I.! III. i. Cork Wood and Majarambout Crags!

O. alba L. Similar places; rare or error? 3–5. Leaves much smaller, male cymes forming a leafless raceme. I. *Tournef.*? Leman's specimens from Gibraltar are certainly *O. lanceolata* and not this (see K. Fl. p. 174). III. i. Mountain region of San Roque, *K.*, *D.*?

Thesium humile Vahl. Stony rough ground; rare; 2–4. I. Above Levant Battery!

Aristolochiaceæ.

Aristolochia bætica L. (*A. glauca* Desf.). Rough bushy places; abundant on Rock, rather rare in Spain; 11–5. I.! III. i. Cachon! Alcadeza Crags! First Pine Wood! ii. Carnero Hills! Algeciras, *Rev.*

A. longa L. Woods and open grassy places; frequent; 2–5. I. *K.* III. i. Upper part of Campo Common! Carteian Hills, &c.! ii. and iii.!

[*A. rotunda* L. has a globose tuber, and a closed sinus to the leaves. I. *K.* Never confirmed.]

Euphorbiaceæ.

**Ricinus communis* L. var. *africanus* Mill. Waste places near buildings; occasional. The var. is a shrub. I never saw it annual. I. Reclamation Road! Sandpits! Lower Lines! III. i. San Roque! Puente Mayorga! Almoraima! ii. About Algeciras!

Mercurialis elliptica Lamk. Heathy ground; locally frequent; 3–5. Shrubby, erect and stiff, quite glabrous, leaves subcoriaceous, rather finely crenate. III. i. Second Pine Wood to Long Stables!

†*M. Reverchoni* Rouy. Bushy places and in woods; locally common; 1–6. Perennial, straggling, flaccid, leaves deeply incised. III. ii. All over mountains! Near Cachon Farm! Lobo Valley!

M. annua L. Waste places; abundant; 1–12. Very variable in size, and in colour and shape of leaves. The complete female appears rare. I.! III.!

Var. *ambigua* Duby is as common as type. I.! III.!

Crozophora tinctoria A. Juss. Cultivated ground; rare; 6–8. Annual, with some look of a *Heliotropium*, but very different inflorescence. III. i. Opposite Francia's Farm! By First Pine Wood! iii. Guadacorte!

Euphorbia Peplis L. Sands near sea; rare; 5–9. Leaves obliquely truncate at base, seeds large, smooth. II. *Hurst*! III. i. Sand dunes, *Brouss.*, *Duf.*, *&c.* iii. Palmones, *D.*

†*E. gibraltarica* W.-Dod in Journ. Bot. 1914, 13. Sandy or gravelly places; rare; 5–9. Like last, but leaves larger, blotched with reddish black, smaller capsules, and small blackish, 3-keeled, foveolate seeds. III. i. Railway at Second Venta!

E. Chamæsyce L. †var. *canescens* Boiss. Sandy or gravelly places; locally frequent? 5–9. Much smaller, seeds tetragonous, reticulate rugose. I. In small patches all over the Neutral Ground, and cannot fail to attract attention, *K.* In Fl. p. 70, Kelaart says the station is the North Front. I have not seen it in either, but it is easily overlooked. III. i. Sand Desert, *D.* Railway near Second Venta!

E. adenocarpa Guss. Cultivated fields; occasional; 4–5. Tall annual, glands entire, capsule and seeds quite smooth. III. i. Between San Roque and S. Lorca! ii. Near Cortijo Trinidad!

E. verrucosa Lamk. Damp woods and meadows; rare; 4–6. Perennial, 6–12 in., glands entire, capsule with cylindrical warts,

seeds smooth, leaves finely serrulate, glabrous. III. i. San Roque, *Fritze*.

[*E. flavicoma* DC. Heathy places; rare; 4–6. Like last but shorter, capsule warts hemispherical, leaves closely serrate. I. *Dasoi*?]

†*E. rupicola* Boiss. Bushy rocky slopes; locally abundant; 12–6. Shrubby, much branched, 2–4 ft. or more, involucral leaves bright yellow, capsule densely warted. I. Chiefly Mediterranean Steps and Middle Hill! A form with densely pubescent leaves occurs at the former place! III. i. Alcadeza Crags, a much less branched form! ii. Mountains!?

E. pubescens Vahl. Marshes; common; 3–8. Stout, little branched; very villous, glands entire. III.!

†*E. pterococca* Brot. Dry fields; common; 2–5. Small, dark green, annual, glands entire, capsule with wavy wings. I. Near Michael's Cave! III.!

E. Helioscopia L. Roadsides and waste places; common; 1–5. I.! II.! III.!

E. exigua L. Fields and grassy places; abundant; 2–5. Leaves acute. III.!

Var. *retusa* L. Similar places; more abundant. Leaves shorter, retuse. Looks distinct but intermediates occur. III.!

Var. *tricuspidata* Koch. Leaves dilated and tricuspidate at apex. III. i. Between Gibraltar and San Roque, *D.* Malaga Gardens!? ii. Beyond Carnero Point!?

E. Peplus L. Roadsides and waste places; very common; 1–5. Foveæ of seeds four on back and three on sides. I.! III.!

E. peploides Gouan. Similar places; common? 2–4. Like last but usually smaller, seeds with three foveæ on back, two on sides. I.! II.! III. i. San Roque, *D.* ii. Algeciras, *Ball.*

E. falcata L. Similar places; rare? 4–6. Rather like *E. Peplus* but leaves broader, acute, capsule deeply sulcate and keeled, seeds transversely sulcate. III. i. Beyond Linea Cemetery! Cruz del Padre Ventura! Pinar de los Bigotes! iii. Railside near Guadacorte!

E. medicaginea Boiss. Sandy fields and gravelly slopes; abundant; 3–5. Annual, with bright yellow involucral leaves, glands bicornate, seeds black with white reticulate ribs. I. About Willis's! III.! Often forming large yellow masses in fields!

E. segetalis L. Cultivated fields and woods; rather rare? 3–6. Annual, dull glaucous green, capsule granulated on back, seeds ashy grey, irregularly foveolate. [I. Wrongly attributed to Von Martius by Kelaart.] III. ii. Slopes above Waterfall Valley! I think I have seen this elsewhere, but it closely resembles *E. terracina* externally, and I may have taken it for that.

E. portlandica L. Rough bushy places and woods; locally common; 3–5. Perennial, with closely imbricated dark green leaves, capsules granulated and seeds foveolate. I. From Europa to above Mediterranean Road! II. *K.*, *D.* III. i. Sand dunes and Spanish racecourse. *K.*, *D.* ii. Mountains over Pelayo!

†Var. *intermedia* Porta & Rigo. A tall very straggling form.

III. i. Cork Woods! Majarambout Woods! I do not know whether the name has been published.

E. bætica Boiss. (*E. trinervia* Boiss.). Sandy places and among bushes; locally frequent; 3–6. Perennial, laxly branched, leaves narrow, capsule longly stipitate, smooth, seeds foveolate. I. Above Catalan Bay! Sea sand near Inundation, *K.* III. i. Bonel's Farm! Near Spanish racecourse, *Boiss.*, *Kel.* Alcadeza Plain! Cork Woods!

E. serrata L. Sandy and bushy ground; rare; 3–6. Leaves strongly serrate, the involucral bright golden yellow. I. *Lem.*! III. i. Bonel's Farm! Foot of S. Carbonera and of San Roque, *K.*, *D.* Pinar de los Bigotes! ii. Foot of S. de Palma, *K.*, *D.* iii. Railway near Guadacorte!

E. terracina L. (*E. provincialis* Willd.). Sandy places; frequent; 2–5. Perennial, many stemmed, capsule and seeds smooth. I. North Front! Reclamation Road! Sandpits! Victoria Battery! II.! III. i.! ii. Algeciras, *K.*, *D.*

Var. *latifolia* Boiss. has broad leaves. II. *K.*, *D.*

†Var. *angustifolia* Lange has narrow leaves. II. *K.*, *D.* III. i. Lajo below First Pine Wood!

†Var. *retusa* Boiss., leaves obovate, deeply obcordate. II. *K.*, *D.*

[*E. Esula* L. is wrongly attributed to Von Martius from the Rock by Kelaart.]

E. Paralias L. Sea sand; locally rather frequent; 5–8. Perennial with broad, coriaceous, adpressed leaves. I. *Ayala.* II.! III. i. Linea, *K.* First River! ii. Palmones Playazo! iii. Palmones Sands!

E. Characias L. Wooded and rocky places; locally frequent; 2–4. Tall, very stout, unbranched, often 3–4 ft. high, inflorescence racemose, glands purple, entire. I. About Signal Station Road! Always quite glabrous. III. i. Cork Woods about Almoraima! Always pubescent.

Callitrichaceæ.

Callitriche verna Kuetz. Ditches or streams; rare? 5–10. Leaves mostly obovate, styles erect, deciduous, fruit with acute keel. An ambiguous species, probably included in next. III. i. Near San Roque, *Wk.*?

C. stagnalis Scop. Similar places; frequent; 4–5. Leaves as last, styles diverging, persistent, fruit winged. III. ii. In the mountains! Palmones Playazo!

†*C. hamulata* Kuetz. Similar places; rare? 4–5. Leaves, at least lower, linear, keel of fruit winged. III. i. Campo Common! ii. Near Palmones Pinar!

Urticaceæ.

Theligonum Cynocrambe L. Rocks, walls and banks; locally common; 2–4. Stem and bright green leaves subsucculent. I.! III. i. Cachon! S. Carbonera, *D.*

Parietaria mauretanica Desr. var. *latifolia* Lge. Rocky and bushy places; local; 1–5. Leaves very broad, subcordate. I. North slopes, both sides!

P. diffusa Mert. & Koch. Similar places; abundant on Rock,

less so in Spain; 1–12. Very variable. I.! III. i. Seen but no stations noted! ii. Palmones Playazo! About Algeciras! Carnero Hills!

Var. *fallax* G. & G. has subsimple erect stems. I.! I think frequent. Mr. Druce thinks my 1579, from Rock Gun Catchment, may be *P. erecta* M. & K., a distinct species like var. *fallax*, but with perianth not elongating after flowering, but the specimen is too young for determination.

P. lusitanica L. Walls and rocks; rare? 3–5. Like a diminutive diffuse *P. diffusa*, but leaves darker green, rounder, and glomerules subsolitary. I. Main road near St. Bernard's! Below Devil's Gap!

Urtica urens L. Waste and cultivated ground, chiefly near buildings; very common; 11–5. I.! II.! III.!

U. membranacea Poir. Similar places; equally common; 11–5. Usually diœcious, though described as monœcious. The female appears about six weeks after the male. I.! II.! III.!

[*U. dioica* L. is reported as common on the Rock by Kelaart and Dautez, but by no other collector.]

Celtis australis L. Hedges and rough slopes, often planted; 4–5. I. Levant! Signal Station Road, &c.! III. i. Lajo Valley!

**Ficus Carica* L. Rocks and stony places; completely naturalised in very many places; 4–6. I.! III.! Reaches high up the mountains!

[*Ulmus campestris* Sm. is probably always planted, as about Algeciras, El Cobre, Lajo Valley, &c.! I believe this species, but I have not seen fruit.]

[*Morus nigra* Willd. is only planted.]

CUPULIFERÆ.

Quercus lusitanica Webb. Woods; common; 3–4. Leaves very large, more or less deciduous.

Var. *faginea* Lge., the type, has dentate or subentire leaves, and appears rare. III. ii. S. de Palma, *Boiss., Wk., &c.*

Var. *bætica* Webb has coarsely sinuate crenate leaves, and is common. III. i. Cork Woods! ii. Mountains!

Q. humilis Lamk. Woods and heaths; very common; 3–4. Leaves incanous beneath, hardly spinose. I think it seldom grows with *Q. coccifera*. III. i. and ii.!

Q. Suber L. Woods; abundant; 4–5. [I. Introduced.] III. i. and ii.!

Q. Suber × *Ilex* Lag. With the parents; rare; 4–5. III. i. Near San Roque, *D.*

Q. Ilex L. Woods; rare? formerly frequent? 4–6. I. Inaccessible places on west slopes, *K.* Near Breakneck Battery, two trees! Above Catalan Bay, one tree! III. i. Cork Woods!

Q. coccifera L. Heaths and woods; very common; 3–5. Leaves shining, quite glabrous both sides, often very spiny. I. Under the shade of larger trees, *K.* Are these not root shoots of *Q. Ilex*? I have not seen it. III. i. and ii.! In deep sand at Palmones Playazo!

AMENTIFERÆ.

Alnus glutinosa Gaertn. var. *denticulata* Regel. By streams, chiefly in woods; locally plentiful; 1–3. III. i. Cork Woods! ii. By many streams from the mountains above Algeciras! iii. Salt Pans!

Salix alba L. By water holes and streams, doubtless often planted, but native in many places; 3–4. III. i. About San Roque! Cork Woods! ii.! iii. About Salt Pans!

†*S. cinerea* L. Similar places; frequent, commonly planted by water holes; 1–3. III. i. By the Lajo! Cork Wood Sotos! ii. Waterfall Valley! Carnero Hills! iii. Salt Pans!

S. pedicellata Desf. Similar places; occasional or frequent; 1–3. Catkins produced on pedunculate leafy shoots, leaves like last. III. i. By Lajo at First Pine Wood! ii. Waterfall Valley!

[*S. babylonica* L. is occasionally planted, as by river above San Roque Station!]

Populus alba L. Woods and by mountain streams, often planted, but here and there native; 1–3. [I. Planted.] III. i. Near First Pine Wood! Almendral! Almoraima! ii. Valley over Frayle Bay! iii. Guadacorte!

[*P. pyramidalis* Rozier, the Lombardy Poplar, is often planted.]

CYTINACEÆ.

Cytinus Hypocistis L. On roots of *Cistaceæ*; occasional; 3–5. III. i. Summit of Chair! Cork Wood Crags! Pine Wood Plains! ii. Mountains south of Waterfall Valley!

CONIFERÆ.

†*Pinus halepensis* Mill. Woods; rare; 4–5. Cones rather long, shining, deflexed. III. i. Between San Roque and Castellar, *D.*

[*P. sylvestris* L. and *P. Pinaster* Ait. are planted. They both have small cones, *P. Pinaster* having longer leaves and larger cones, scales with acute ridges.]

P. Pinea L. Woods; frequent; 4–7. Cones large and ovoid or subglobose, scales with obtuse ridges. III. Forms the Pine Woods in many places, but also planted!

Juniperus Oxycedrus L. Rocky ravines; rare; 3–7. I. West slopes, *Schott?* III. i. Hills above S. Carbonera, *D.*

GNETACEÆ.

Ephedra fragilis Desf. Rocky slopes and sandy places; frequent on Rock, occasional in Spain; 4–6. Dr. Stapf says all he has seen from the Rock is the type, *i.e.* var. *Desfontainei* Stapf. It varies much in habit. I.! Especially about Levant! III. i. Puente Mayorga! ii. Palmones Playazo! Rocks at Algeciras, *Winkl.*!

[*E. altissima* Desf. (*E. gibraltarica* Boiss.?). Dr. Stapf says all he has seen from here so named is *E. fragilis*. The true *E. altissima* is a very different species.]

LEMNACEÆ.

Lemna gibba L. Water holes; occasional; 4–6. I. Near Inundation, *de Coincy*. III. i. Linea! ii. Palmones Playazo! iii. Palmones Sands!

L. minor L. Similar places; locally frequent; 4–6. III. i. Lajo below Almendral! ii. and iii. With the last!

NAIADACEÆ.

†*Zannichellia macrostemon* J. Gay. Pools; rare; 4–6. III. i. Near San Roque, *Nilss*. ii.!? My 1112, a young state, from a roadside pool towards Palmones Pinar, may be this or *Z. palustris* L., a frequent species in the province.

†*Potamogeton americanus* Cham. & Schl. (*P. fluitans* Roth). Streams; locally common; 6–8. III. i. In the Lajo and its tributaries! ii. In mountain swamps!

†*P. pusillus* L. var. *elongatus* Ar. Benn. Streams; rare; 5–6. III. i. In the Lajo and its tributaries!

[*Ruppia rostellata* Koch is reported from the Inundation and Neutral Ground by Kelaart and Dautez, and is attributed to Boissier by Debeaux, but Boissier's specimen is correctly labelled *R. maritima*!]

R. maritima L. (*R. spiralis* Dum.). In salt water; locally abundant; 8–10. Peduncles spirally coiled. I. The Inundation is full of it! Near the convict station, *K.*; now built on. III. ii. and iii. Salt marshes at San Roque and Algeciras, *Nilss*.

Zostera marina L. In the sea or tidal rivers; frequent? 6–7. I. Western shores, *K*. II. and III. All round the Bay, *K.*, *D*.

Posidonia Caulini Koenig. In the sea; rare? 4–8. With a large tuft of dead leaf sheaths at base, flowers in longly peduncled spathes. I. Near the North Front Guard, *Kel.*, *Boiss*. III. ii. Algeciras, *D*.

ALISMACEÆ.

†*Alisma ranunculoides* L. Pools, ditches and streams; very common; 4–6. II.! III.!

A. Plantago L. Similar places; much less common; 4–6. The type has leaves broadly rounded or cordate at base, and is rare. III. i. Sand desert below Pedrera, *D*.

Var. *lanceolata* G. & G. with leaves narrowed below, is the usual form. III. i. Lajo Valley! Carteian Hills! Campamento Common! ii. Algeciras, *Rev*. Palmones Playazo! iii. Salt Pans!

JUNCAGINACEÆ.

Triglochin maritimum L. Salt marshes; rare; 4–5. Spikes dense, fruit of six carpels. III. i. Sand dunes below S. Carbonera, *D*.

T. Barrelieri Lois. Fresh water marshes; occasional; 1–3. Spikes very lax, fruit of three carpels. III. ii. Palmones Playazo! iii. Guadarranque Marshes!

[*T. palustre* L. is recorded from near Gibraltar by Schott (*ex* Colm.) in addition to *T. Barrelieri*, but is unconfirmed.]

Aroideæ.

Arisarum vulgare Kunth. Dry open and bushy places; very abundant; 11–1. I.! III.!

Arum italicum Mill. Shady banks; rather frequent, and quite native; 3–4. I. Sandpits! Above Willis's! Above Engineer Road! III. i. Malaga Gardens! ii. and iii.!

[*A. maculatum* L. is recorded from Algeciras by Clemente, but is unconfirmed.]

[*A. Dracunculus* L. is subspontaneous here and there, but I have not seen it.]

**Colocasia antiquorum* Schott. Shady ravines; quite naturalised in one spot; 6–7. III. ii. Valley below Waterfall!

Typhaceæ.

Typha latifolia L. Pools and streams; rather rare; 6–7. My gathering has rather narrow leaves, 3–3½ lines wide, and male spike about ¼ in. above female. It may be a hybrid. III. i. Near Almoraima! ii. In the Miel! iii. Guadacorte Marshes! Salt Pans!

T. angustifolia L. Similar places; locally common; 6–7. More frequent than my records show. III. i. In the Lajo! ii. Carnero Hills! iii. Guadacorte Marshes! Salt Pans!

Sparganium ramosum Huds. In streams; locally common; 4–7. III. i. In the Lajo! Cork Wood Sotos! ii. In the Miel! Marsh below El Cobre! Towards El Saladillo!

Palmeæ.

Chamærops humilis L. Bushy hills; very common; very rarely in woods or heathy places; 4–5. I.! Often with a trunk 4–6 ft. high. III.!

Orchidaceæ.

Serapias cordigera L. Woods, rarely open ground; rather locally frequent; 4–5. I. West slopes, *K.*, *Schott*. III. i. Queen of Spain's Chair! S. Lorca! Cork Woods! ii. M. de la Torre! Palmones Pinar! Waterfall Valley, especially at El Cobre! My 1895, from marshy open spots near railway beyond upper Miel Bridge, is a peculiar form in an unusual situation, with small flowers, and a rather narrow lip, almost intermediate between type and *S. Lingua*, but Mr. Rolfe thinks it belongs here.

S. occultata J. Gay. Damp grassy places; rare? 4–5. Flowers smaller than next, hidden in bracts except lip, which is short, narrow, and reflexed, the basal ridges pale and distant. III. ii. Near Algeciras, *Rev.*, *Frere*. Carnero Point!

S. Lingua L. Similar places; very common; 4–5. Lower perianth lobes more exposed, lip nearly twice as long as last, and broader, basal ridges dark and close, so that they are described as one. I.? West slopes, *Schott*. II.! III.!

Orchis papilionacea L. Bushy ground; very rare; 4–5. Lip large, reddish purple. III. i. Magazine Hill, a single plant!

O. Morio var. *picta* Reichb. Woods and bushy places; rare; 3–5. Spur truncate, almost as long as ovary. III. i. Between

Almoraima and Long Stables! North slopes Alcadeza Crags! About San Roque, *Wk.*

O. coriophora L. var. *Polliniana* Reichb. f. (*O. fragrans* Poll.). Hedges; very rare; 4–5. Flowers rather small, livid purple, in a dense spike. III. i. A plant or two by railside beyond Almoraima!

O. lactea Poir. (*O. variegata* All. var. *acuminata* Boiss.). Rough slopes; rather rare; 2–3. I. Below Signal Station! Spy Glass! i. Grassy places in woods near San Roque, *Wk.*

O. longicruris Link. Similar places; very rare; 3–4. Allied to *O. Simia* Lamk. I.? West slopes, *Schott.*

O. laxiflora Lamk. var. *longibracteata* Wk. Marshy ground; very common; 3–5. The var. has a dense spike, with bracts longer than ovary, the lowest foliaceous, and is alone recorded, but I think type is found frequently. III. ii. and iii.! No note from i., but I believe it occurs.

†*O. palustris* Jacq. Woods; very local; 4–6. Flowers much paler, lower lip 3-lobed, the central largest and longest, usually divaricately lobed. III. ii. Upper Waterfall Valley!

O. longibracteata Biv. Woods; rare; 3–4. Leaves very large, sepals connivent, flowers large, lip rose-purple, spotted, 4-lobed, the two central divaricate. III. i. S. Carbonera, *Frere.* ii. Algeciras, *Frere.*

†*O. cordata* Willd. Rough shady slopes; locally rather frequent; 2–4. Flowers green, leaves broadly ovate, cordate. I. Upper Rock from Lower Union Gallery to Mediterranean Steps! Rocks above Catalan Bay! III. i. Cork Wood Crags, rare! ii. Waterfall, rare!

Ophrys aranifera Huds. var. *atrata* Reichb. Rocky slopes; rare; 3–4. Lip longer than sepals, subtrilobed, blackish purple, basal bosses conical, salient. I. South and west slopes, *Frere, Schott, D.* A specimen from the Rock by Lemann, labelled *O. aranifera*, is *O. fusca*!

O. tethredinifera Willd. Grassy and bushy slopes; locally rather frequent; 2–4. Rather like next but shorter, with a shorter spike. I. Communicated, *K.* III. i. Queen of Spain's Chair! Carteian Hills! North of San Roque! ii. North of Algeciras! El Cobre! Carnero Point!

O. apifera Huds. Watercourses and marshes; rather common; 4–5. Occasionally almost white. I. About Willis's! Glacis, a single specimen! South slopes, *D., Rev.* III. i. Carteian Hills! Campamento Common! Long Stables! ii.! iii. Guadacorte! Salt Pans!

O. Scolopax Cav. Dry bushy places; rather rare; 4–5. Rather like last, but flowers much smaller, usually white, rarely pale rose. III. i. Near San Roque Station! S. Carbonera, *D.* By Arroyo Viejo near Patxot's farm! Alcadeza Crags! ii. About El Cobre! Hills west of Algeciras!

O. bombyliflora Link. Grassy places; frequent; 2–4. Flowers greenish, lip dark, with very acute bosses. I. One or two specimens near Signal Station! II.! III. i. Path to First Pine Wood, and on neighbouring hills! ii. Common, to Carnero Point!

O. Speculum Link. Similar places; rare; 3–4. Lip with a large dark blue shining patch, and a papillose fringe. I. Two specimens below Signal Station! III. i. Path to First Pine Wood! Cork Wood Crags! ii. S. de Palma, *Wk.*

O. fusca Link. Rough and grassy slopes; locally rather frequent; 1–3. Lip narrow, dark, with very narrow yellowish edges. I. West slopes! III. i. North of San Roque, occasional! Carteian Hills! ii. Algeciras, *Frere.*

O. lutea Cass. Similar places; rather frequent on Rock, rare in Spain; 2–4. Lip broad, with a broad yellow margin. I. North-west slopes to Signal Station! *Débris* slopes over North Front! III. i. Queen of Spain's Chair, common, *K.* I have never seen it there. Malaga Gardens! ii. Near Sandy Bay! Hills near Algeciras *K.* iii. Guadacorte!

†*Neotinea intacta* Reichb. (*Aceras densiflora* Boiss.). Woods; rare; 4–5. Spikes dense, unilateral, flowers small, pinkish white. III. i. Queen of Spain's Chair, rare, *K.* ii. Between Waterfall Valley and Pelayo!

Spiranthes autumnalis Rich. Rocky places; rare; 10–11. Leaves broadly oval, after flowers, flowers yellowish white. I. From Willis's to Signal Station!

†*S. æstivalis* Rich. Damp grassy places; very rare; 5-6. Leaves lanceolate, contemporary with white flowers. III. i. East slopes Queen of Spain's Chair! ii. Beyond Waterfall!

Epipactis atrorubens Schultz. Woods; rather rare; 4–6. Flowers rather deep red, lip with crisped plicate bosses. III. i. First Pine Wood! ii. Mountains!

Cephalanthera ensifolia Rich. Woods; rare; 3–4. III. [i. Boca de Leon, *Hurst*!], beyond our limits. ii. Slopes south of Waterfall!

†*Limodorum abortivum* Sw. Woods; rather rare; 4–6. Whole plant lavender and white. III. i. Near Long Stables! Majarambout Woods! ii. Waterfall Valley!

Iridaceæ.

Gladiolus segetum Gawl. Cornfields; rather rare? 4–5. Flowers large, distichous, middle perianth segment twice as broad as lateral, seeds not winged. Confounded with next, and certainly not our common species. I.? *K.* III. i. Fields by Lajo! Pinar de los Bigotes! ii. Near railway beyond Algeciras!

G. communis L. Hills, bushy places and fields; very common; 4–6. Flowers much smaller, unilateral, middle segment not much broader than lateral, seeds broadly winged. I.! III.! Reaches high up the mountains!

Iris Sisyrinchium L. Dry fields and roadsides; common; 2–4. I.! II.! III.!

I. Fontanesii G. & G. Grassy places; very rare; 4–5. Resembles *I. Xiphium* L., with large blue flowers. III. ii. Near upper aqueduct! Railside near San Bernabe! One or two plants in each place.

†*I. filifolia* Boiss. Rough heathy and bushy slopes; frequent and locally common; 4–5. I. Upper Rock from north to south!

III. i. Queen of Spain's Chair, *Porta & Rigo*! South slopes of San Roque, *D.* Alcadeza to Majarambout! ii. Waterfall Valley, plentiful!

†*I. juncea* Poir. (*I. lusitanica* Ker). Similar places; rare; 5. Like last, but flowers yellow, tube much shorter. III. ii. Mountains near Algeciras, *Rev.*

I. Pseudacorus L. Swamps and watercourses; locally common; 2–4. III.! Common in Cork Woods!

I. fœtidissima L. Woods; rather rare; 5–6. III. i. Almoraima! ii. Mountains! Carnero Hills!

I. scorpioides Desf. (I. *alata* Poir.). Grassy sandy places; rare; 1–2. III. i. Slopes south of San Roque, *D.*

Romulea Clusiana Lge. Sandy and grassy places; locally abundant; 1–3. Flowers very large, with a bright yellow base. I. Chiefly Europa Flats, Windmill Hill, and North Front! Occasionally on upper west slopes! II.! III. i. Near Spanish racecourse, *Clus.*, *D.*

R. Bulbocodium Ker. Similar places; rare? 1–3. Flowers much smaller, upper spathe membranous, stigmas bipartite, often longer than stamens. [I. Kelaart's note obviously refers to last.] III. i. San Roque, *D.* S. de Palma, *Rev.* Often confounded with *R. ramiflora*, but it is common in the province.

[*R. purpurascens* Ten., recorded by Willkomm and Dautez from San Roque, was founded upon a garden specimen, allied to the South African *R. rosea* Eckl.]

R. ramiflora Ten. Similar places; very common; 1–3. Smaller than *R. Bulbocodium*, upper spathe herbaceous, stigmas bilobed, usually shorter than anthers. II.! III.!

R. gaditana Beg. (*R. Linaresii* Parl. var. *gaditana* Kunze). Similar places; occasional? 1–3. Confounded by Willkomm with *R. ramiflora*, from which it differs chiefly in its much larger flowers, 2–4 times as long, and deeper in colour. III. i. Sand Desert, *D.*, teste *Beguinot*. This may be the plant recorded by Dautez as *R. Columnæ*. Bonel's Farm!? ii. Hills near the Miel!? Specimens from the last two stations (my 148 and 165) probably belong here, but the upper spathes are almost wholly membranous, instead of half herbaceous. They cannot be referred to any of our other species.

R. parviflora Britten in Journ. Bot. 1914, 46 (*R. Columnæ* auct.). Similar places; occasional? 1–3. Like *R. ramiflora*, but flowers very small, pale, seeds dull, angular. II. *D.*? III. i. Sand Desert, *D.*? It is probable that Dautez has confounded the two.

Crocus Salzmanni J. Gay. Bushy places; rare; 10–11. Differs from *C. serotinus* Salisb. in orange, not white filaments, and yellowish, not white throat, and broader leaves. Discovered by Maw (Monog. Gen. Croc. p. 103). I. Windmill Hill!

AMARYLLIDACEÆ.

Leucojum trichophyllum Brot. Sandy or light soil; very rare; 1–3. III. i. [In great profusion on Spanish racecourse, *K.* Kelaart obviously refers to next.] In 1883 I found this in small

quantity by the path to Rocadillo, which is now all cultivation and I think it is exterminated!

L. autumnale L. Similar places; locally abundant; 10–1. [I. A few specimens at Willis's and Ince's, where I planted it in 1883!] III. i. Punta Mala! Campo Common!

Carregnoa humilis J. Gay. Similar places; very rare; 10. III. i. Carteian Hills near Puente Mayorga! Near Almoraima, *D.*

Pancratium maritimum L. Sand dunes by sea; locally abundant; 7–9. I. North Front! II.! III.!

Corbularia Bulbocodium Haw. Rocks on tops of mountains; locally common; 12–3. III. ii. On all the highest ridges!

Narcissus serotinus L. Gravelly places; rather frequent; 10–11. Tall forms with 2–4 flowers are var. *major* P. L. III. i. Campamento Common to Pindalista! Alcadeza Plain! Probably elsewhere, but not seen in flower.

†*N. viridiflorus* Schousb. Damp gravelly and clayey places; frequent; 9–10. In 1883 I gathered on Campo Common, with Maw, a hybrid between this species and the last. III. i. Sand Desert, *D.* Campo Common to San Roque! Carteian Hills! Second Venta! ii. Palmones Pinar to Sandy Bay, and commonly near Algeciras!

N. niveus Lois. Rough bushy places or marshy ground; common, locally abundant; 10–3. On the Rock this grows in dry bushy spots, flowering from October to February; in Spain it inhabits marshes, and flowers from January to March. It varies greatly in shape of perianth segments. I.! III.!

[*N. polyanthus* Lois., a frequent species in the province, with subterete scape, and pale yellow entire corona, was found on the Rock by Clusius, but never confirmed.]

[*Agave americana* L. is very extensively planted, and has become so well naturalised here and there on the Rock and in Spain as almost to deserve inclusion.]

Dioscoraceæ.

Tamus communis L. Bushy and wooded places; rather frequent; 2–5. I.! III. i. and ii.! Common in the mountains!

Smilaceæ.

Smilax aspera L. Bushy ground; frequent? 9–1. I have never seen the type, which has red fruit (*S. rubra* Willd.?), but Debeaux says it is common. The leaves seem to vary too indefinitely to afford specific characters. I. *K.*, *D.* III. *K.*, *D.*

Var. *mauritanica* G. & G., with black fruit, is common. The fruit in all I have seen is smaller and in larger clusters than in the common species of the Italian Riviera, though by description it should be larger than in the type. The forms require elucidation. I.! III.!

Var. *vespertilionis* Boiss. has large leaves, much broader than long, deeply cordate. A robust form, climbing tall trees. III. ii. Top of Waterfall Valley! Seen elsewhere, but no stations noted.

Ruscus aculeatus L. Woods; locally frequent; 2–4. [I. Ala-

meda (Balestrino!, labelled *R. Hypophyllum*). Not native, I think.] III. i. Near San Roque Station! Queen of Spain's Chair! Cork Woods, especially near Almoraima! ii. Waterfall Valley!

†*R. Hypophyllum* L. Woods and crevices of rocks; locally common; 12–4. Floral bracts small, subulate. I.! III. ii. Mountains!

†*R. Hypoglossum* L. Similar places; rare; 2–4. Floral bracts large, foliaceous. I. *Winkl.* III. ii. S. de Palma, *Rev.*

Asparagus acutifolius L. Bushy places and woods; 8–9. Subclimbing, phyllodes dark green, fascicled, 1½–3 lines long, flowers 1–2. I. South and west, *K.*, *D.* III. i. About San Roque and S. Carbonera, *D.* Almoraima Soto!? a very long-spined form.

A. aphyllus L. Bushy places and open fields; frequent; 3–5. Erect, phyllodes stout, solitary, rarely fascicled, 1 in. or more long. Flowers one or several. III.! I have noticed this scattered all over the country, but never in flower or fruit, so made no records.

Var. *stipularis* Baker (*A. horridus* L.) has stouter, very long phyllaries, often 2–3 in. long. III. ii. Algeciras, *Née.*

A. albus L. Similar places; very common on Rock, occasional in Spain; 9–11. Phyllodes soft, pale green, fascicled, flowers several, fruit coral-red when ripe, not black as described. I.! III. i. Puente Mayorga! Carteian Hills! ii. Miel Valley! Near Palmones Pinar! Carnero Hills! iii. Guadacorte! Salt Pans!

[*A. officinalis* L., reported by Kelaart as all but wild on the Rock, has been recorded by no other collector.]

Liliaceæ.

Fritillaria lusitanica Wikstr. var. *hispanica* Baker. Rough slopes; rather rare; 3–5. I. West slopes, rare, *D.*, *K.*, *Lem.* III. i. S. Carbonera, *Rev.* ii. S. de Palma, *Rev.*, *Willk.* Willkomm's record is for *F. messanensis* Raf., which Debeaux says has been confounded with *F. hispanica.*

Var. *stenophylla* Baker is hardly distinguishable by its narrower leaves, smaller less tesselated perianth, and shorter style branches. It seems to be our commoner form. III. i. Bonel's Farm! West slopes Chair! Sandy places near Cork Woods, *Hurst*! ii. Occasional mountain slopes! iii. Fields near shore at Palmones, *Rev.*

Tulipa australis Link. (*T. Celsiana* DC.). Rough slopes, rare; 3–4. III. i. South slopes of San Roque, *Wk.* Near Almoraima, *Wk.* Common round Queen of Spain's Chair, *K.*, *D.* I formerly found this commonly above Campo Common, but have recently searched for it in vain. It may have been exterminated by cultivation.

Ornithogalum narbonense L. Sandy fields, &c., occasional; 4–5. Scarcely distinct from next and perhaps confounded with it. Perianth pure white with narrow green keel, filaments longly attenuate, scarcely half perianth. III. i. At foot of San Roque and S. Carbonera, *D.*

†*O. pyrenaicum* L. Similar places; common; 4–5. Taller, perianth with a broad green keel, filaments abruptly acuminate, nearly as long as perianth. II. A plant or two! III.!

O. unifolium Gawl. Sandy heaths; frequent, locally abundant; 3–5. [I. *K. Fl.* p. 161.] III. i. and ii.! Reaches high up mountains.

O. umbellatum L. var. *longibracteatum* Wk. Bushy or sandy places, and in woods; common; 2–4. I. Levant! Near Monkey's Cave! Europa Flats! Above Haynes's Cave! III.! Reaches top of El Frayle ridge!

Scilla verna Huds. var. *major* Boiss. (*S. Ramburei* Boiss.). Rough slopes and heathy places; frequent, but rather local; 2–4. Taller than type, flowers many, racemose, not subcorymbose, anthers blue. I. Rock Gun! Below Signal Station! III. i. Almoraima! Second Pine Wood! ii. Algeciras, *Lem.*! Palmones Pinar and Heath! iii. Guadarranque Marshes!

S. hemisphærica Boiss. Rough slopes on Rock, and marshes in Spain; locally very common; 3–4. I. Mediterranean Steps! Governor's Cottage! North-west slopes! III.! Rare in i.!

S. monophylla Link (*S. pumila* Brot.). Woods; locally abundant; 1–4. III. i. Queen of Spain's Chair! Cork Woods! ii. Mountains!

S. autumnalis L. Sandy places; abundant; 9–10. I.! III.! Not seen in II., but I have not been there in its flowering time, and no doubt it occurs.

Urginea Scilla Steinh. (*S. maritima* L.). Rough and grassy slopes; common; 9–10. I.! III.! Rare in woods!

[*Endymion campanulatus* Wk. (*Scilla camp.* Ait.) is said by Kelaart to form large beds by the road to San Roque, but it is a sylvestral species not likely to occur there, and not confirmed.]

Uropetalum serotinum Ker. Sandy fields; rare on Rock, frequent in Spain; 3–4. The flowers are always olive-brown or greenish, but often turn quite vermilion on drying. Is this the origin of *U. fulvus* Rouy, which is described as having fulvous or orange flowers? I. Mediterranean Steps! Levant! II.! III.!

Muscari comosum Mill. Sandy and grassy fields; common; 3–4. I. Below Victoria Battery and above Alameda, *Lem.* Europa Flats, *Capt. Luck.* II.? Abundantly, *K.* From Kelaart's mention of the races I think North Front is meant, but I have seen it in neither. III.! Rare in ii.!

Simethis bicolor Kunth. Open woods and bushy hills; rather locally common; 2–5. III. i. Queen of Spain's Chair and elsewhere! ii. Mountains!

[*Aloe arborescens* Mill. is only planted.]

Asphodelus fistulosus L. Dry sandy soil, rocks, and old walls; locally frequent; 2–4. I.! North Front! II.! III. i. S. Carbonera, *D.* iii. Salt Pans!

A. microcarpus Viv. Rocky slopes, fields, and woods; very common; 1–4. Always spreading-branched, bracts pale, rather narrow, filaments papillose to middle, claws square or twice as long as broad, fruit ovoid, 5 lines long by 4 lines wide, central keel as prominent as angles. I.! III.!

†*A. serotinus* W.-Dod in Journ. Bot. 1914, p. 13. Woods and

rocky slopes; locally common; 5–6. Habit of last, but rather more slender and glaucous, often taller, bracts broad, fruit small, much narrowed in lower third, 3 lines long by 2½ wide. Flowers much later. III. i. From Alcadeza Crags near Second Pine Wood to Boca de Leon!

A. cerasiferus J. Gay. Similar places; locally very common; 2–4. Rarely branched, spike very dense, bracts broad, pale, filaments smooth except claw, which is four times as long as broad, fruit depressed globose, umbilicate at base, 7 lines long by 8 wide, valves thick, central ridge faint. III. ii. Mountains!

†Var. *albus* Baker. Similar places; local; 2–4. Doubtfully distinct, occasionally with a long erect branch or two, bracts very dark, fruit globose, not umbilicate, 5 lines long by 6 wide. I. About Levant! III. ii. Occasional with type!

Allium paniculatum L. var. *pallens* G. & G. Sandy and stony places; occasional; 5–7. Stamens simple, perianth segments truncate, pale, with green or olive band, often turning rosy on drying. The type (not recorded) has rose flowers. I. Old walls, *Rev.*, *K.*, *D.* III. i. About San Roque and S. Carbonera, *D.* By Lajo! Alcadeza Crags! Path to Malaga Gardens! ii. Near Cortijo Trinidad! iii. Behind Palmones Village!

†*A. sphærocephalum* L. Sandy ground; rare; 6–7. Leaves semicylindrical, heads small, compact, flowers deep crimson, ovoid, petals connivent at tips, anthers exserted, middle cusp as long as lateral, and half as long as claw, auxiliary bulbs often some way above main bulb. I. Catalan Bay! Levant! III. i. Rail beyond Almoraima!

†*A. rubro-vittatum* Boiss. & Heldr. Rocky places; rare; 6. Slender, 4–6 in., bulb small, leaves semicylindrical, flowers white with red band. III. ii. S. de Palma, *Rev.*

A. Ampeloprasum L. Stony ground; occasional; 5–6. Stout, bulb large, with many small bulblets, leaves flat, flowers white in type. III. i. Between S. Lorca and Alcadeza Crags! Almoraima Soto, a field full! ii. Railside beyond Algeciras! iii. Salt Pans!

†Var. *atropurpureum* Regel has dingy purplish flowers, locally common. I.!

A. roseum L. Rough bushy places; rather frequent on Rock, occasional in Spain. Flowers large, pale pink, few, in a loose umbel. I.! III. i. Almoraima! Alcadeza Plains! ii. Railside near Algeciras! M. de la Torre! Carnero Hills!

A. neapolitanum Cyr. Fields and hedges; rare; 3–4. Like last, but perianth more spreading, pure white, stem trigonous. [I., *K.* Kelaart was uncertain as to the name.] III. i. San Roque, *D.*

†*A. nigrum* L. Fields and grassy places; occasional; 4–5. Stout, heads dense, flowers dingy pink, perianth stellately spreading. III.! Very common north of San Roque!

†*A. Moly* L. var. *stramineum* W.-Dod (*A. stramineum* Boiss. & Reut.). Mountain slopes; locally frequent; 4–5. Flowers large,

yellow, in a lax umbel. Leaves narrower and flowers paler than in type. III. ii. Mountains!

A. Chamæmoly L. Marshy places; very local; 11-2. Very dwarf, flowers white, leaves long, flat, spreading. III. ii. By railway near Algeciras!

A. subvillosum Salzm. Sandy ground; rare; 1–2. Like last, but much taller, leaves densely ciliate. III., *Née*, *Navarro*. ii. Lane at Palmones Playazo!

A. triquetrum L. Bushy places; very common; 2–4. I.! III.!

[*A. vineale* L. and *A. ursinum* L. reported to Kelaart from the Rock have never been confirmed.]

**Nothoscordum fragrans* Kunth. Sandy places; occasional; 4–6. Flowers creamy white, with a red band; no alliaceous odour. I. Bruce's Farm! III. i. Campamento Village! ii. Palmones Playazo!

Colchicaceæ.

Colchicum Bivonæ Guss. (*C. autumnale* L. var. *gibraltaricum* Kel.). Rough slopes; locally frequent or common? 9–10. I. Middle and upper slopes! III. i. Behind Campo Cemetery!

Juncaceæ.

Juncus acutus L. Sandy or muddy ground, chiefly near sea; common; 3–5. Very pungent and rigid, heads terminal, dense, capsules very large. I., *Ayala*. By Sentry Fence! II.! III.! Malaga Gardens!

J. maritimus Lamk. Similar places; locally abundant; 5–7. Tall and rigid, heads terminal, much laxer and longer, capsule smaller. III. i. Linea, *K*. ii. Palmones Playazo! About Algeciras! iii. Salt Pans! Aguacorte!

J. subulatus Forsk. (*J. multiflorus* Desf.). Muddy places near sea; locally common; 5–7. Leaves not septate, inflorescence lax, flowers not in clusters. III. ii. Behind Sandy Bay! Near Reina Cristina Hotel! iii. By Railway! Tidal Rivers! Salt Pans!

Var. or sp. aff. My 2200, with short capitate inflorescence, from marsh near Algeciras, may be a new species allied to this!

J. Tenageia L. fil. Marshy and sandy places; locally common; 4–5. Annual, slender, inflorescence very lax, capsules small, subglobose, dark brown. III. i. Hills near San Roque, *Ball*! ii. Marshes in Waterfall Valley! iii. Palmones Sands!

J. bufonius L. Damp roadsides, streams, &c., very common; 4–5; III.!

Var. *fasciculatus* Koch, with two or more flowers in a cluster, is commoner than type. II. Rare, *K*. III.!

†*J. foliosus* Desf. Similar places; rare? 4–5. Leaves more numerous, broader, 1 line or more, sepals with two black lines on back. III. ii. Marsh south of Waterfall Valley, and in a valley a mile north of it!

J. glaucus Ehrh. By streams; occasional; 5–7. Wiry, stems leafless, inflorescence lateral, basal sheaths very shining, dark

brown. III. i. By Lajo! Almoraima Soto! ii. Below El Cobre! Near Las Corzas! Carnero Hills! iii. Salt Pans!

J. effusus L. Similar places; rare; 5–8. Habit of last, but soft, stems finely striate, flowers greenish, usually in a diffuse panicle, capsule not mucronate below style. III. ii. At and beyond Waterfall!

Var. *compactus* Hoppe has dense compact inflorescence. III. ii. Below El Cobre!

J. conglomeratus L. Similar places; rare; 5–8. Near last, but stem finely striate and rugulose, inflorescence dark, compact, and capsule mucronate below style. III. ii. Below El Cobre!

J. obtusiflorus Ehrh. Marshes and by streams; frequent, locally abundant; 5–6. Stem leafy, leaves septate, inflorescence with very divaricate branches, perianth segments whitish, all obtuse. III. i. By the Cagancha! Near First Venta! By Lajo! Cork Wood Sotos! ii. Palmones Playazo! iii. Guadacorte Marshes!

†*J. sylvaticus* Reichb. fil. Similar places; rare? 6. Leaves septate, panicle branches ascending, perianth segments all very acute, pale. III. ii. Near Waterfall!

†Var. *confertus* Lge. has heads more compact. III. ii. Valley above Waterfall!

J. lamprocarpus Ehrh. Similar places; occasional or frequent; 5–7. Like last, but branches ascending, perianth segments very dark, outer acute, inner obtuse. I believe more general than my records show. III. i. Lajo below First Pine Wood! ii. By Lobo behind Sandy Bay!

J. striatus Schousb. Similar places and in fields; rather common; 5–7. Stems subsolitary, short, leaves septate, much compressed and striate, inflorescence blackish. Like last, but all perianth segments acuminate, with spreading tips. II.! III.!

J. Fontanesii J. Gay. Marshy places; occasional or frequent? 5–7. Habit of last, but usually in larger patches, less leafy, perianth green or reddish, with long acuminate tips. III. i. By Lajo! Marsh near Second Venta! Seen, I think, in several other places, but no records kept.

†*J. supinus* Moench. Similar places; locally frequent; 6–8. Dwarf, cæspitose, leaves filiform, septate, heads small. Very variable in habit. III. ii. Waterfall Valley!

†Var. *uliginosus* Roth. is a lax procumbent rooting form. III. ii. With type!

†*J. pygmæus* Rich. Sandy ground; very rare; 4–5. Annual, very small, stem-leaves 1–3, glomerules several, perianth segments green, adpressed. II.!

†*J. capitatus* Weig. Similar places; occasional or frequent; 4–5. Dwarf annual, stems leafless, glomerules solitary, perianth segments dark, tips spreading, very acute. III. i. Bonel's Farm! Near Punta Mala! Almoraima, *P. L.* ii. Near Algeciras, *Nilss.* S. de Palma, *Rev.*

†*Luzula Forsteri* DC. Woods; locally frequent; 2–3. III. i. First Pine Wood! Cork Woods! ii. M. de la Torre! Mountains!

Cyperaceæ.

Cyperus capitatus Vand. (*C. schœnoides* Griseb., *Schœnus mucronatus* L.). Sand-dunes; locally common; 4–6. I. Catalan Bay! North Front! II.! III. i. Linea! ii. Sandy Bay! Palmones Playazo! iii. Palmones Sands!

C. rotundus L. (*C. olivaris* Targ.-Tozz.). Roadsides and waste places; rather frequent; 4–12. I. Below Lunatic Asylum! North Front! In the town, *K.* II. *K.*, *D.* III. ii. Algeciras Station and south of the town! iii. Sands by Palmones River, *Boiss.*, *Wk.* Salt Pans! Guadacorte!

**C. esculentus* L. Similar places; rare? 7–9. Taller, spikelets paler, shorter, distichously set. III. ii. Sea sand by Palmones River and Algeciras, *Rev.*

C. longus L. Wet places; type rare; 3–8. III. i. Almoraima Soto! A form with few, small, pale spikelets.

Var. *badius* C. B. Clarke. A tall stout plant, very common. II.! III.!

†*Pycreus Mundtii* Nees (*Cyperus Eragrostis* Wk. non Vahl., *C. turfosus* Salzm., *C. pallescens* Deb. non Desf.). Marshes; rare; 5–7. Short, leafy, leaves shorter than stem, the involucral shorter than rays, rays 4–5 long and 2–3 subsessile, spikelets rather dark, lanceolate. III. i. Alcadeza Crags! Soto Gordo! ii. Salt marsh near Algeciras, *Rev.*!, erroneously named *Cyperus pallescens* Desf. iii. Near Palmones, *Rev.*, probably this.

P. flavescens L. (*Cyperus Gussonei* Gasp.). Marshes; rare? 5–7. Annual, tufted, short, slender, spikelets pale, subcapitate. III. ii. Algeciras, *Rev.*

P. globosus Reichb. Damp sandy places; very rare; 6–8. Heads dense, globose, whitish. III. i. A single clump near ford between San Roque and Pinar de los Bigotes!

Eleocharis palustris R. Br. Pools and wet places; common; 3–6. II.! III.!

†*E. multicaulis* Sm. Damp heathy spots; occasional or locally frequent; 3–6. III. i. Queen of Spain's Chair! ii. Waterfall Valley!

Schœnus nigricans L. Similar places; locally common; 2–5. III. i. Foot of Chair both sides! Arroyo Viejo! Alcadeza Plains! ii. By Miel! Beyond Carnero Point!

Scirpus cernuus Vahl. (*S. Savii* Seb. & Maur.). Streams and wet places; rather frequent; 3–7. III. i. Cork Wood Sotos! ii. Palmones Pinar and Playazo! Mountains! iii. Salt Pans! Guadacorte Marshes!

Var. *Vahlii* Lge. has larger solitary heads, with shorter bracts. III. ii. Near Algeciras, *Fritze.*

S. lacustris L. Marshes; locally plentiful; 4–7. III. i. Between Almoraima and Long Stables! iii. Guadacorte Marshes!

S. sp. Pools; very local; 5–7. Stems very tall, pale, subcylindrical, inflorescence diffuse, branches 7–8, very unequal, each with 3–8 unequally pedicelled heads, umbellately set, $2\frac{1}{2}$–3 lines long. Near *S. littorale* Schrad., but stem not triquetrous. Pro-

bably a new species, but my specimens are too young to describe fully. III. i. Campo Common!

S. Holoschœnus L. Sandy places; very common; 4–6. II.! III.!

Var. *australis* Koch has smaller fewer heads, and grows with the type. III.!

S. maritimus L. Pools and ditches, and by rivers; very common; 3–6. II.! III.!

Var. *compactus* Reichb. fil. is a form with sessile heads, hardly worth distinguishing. It grows frequently with type. II.! III.!

†*Fuirena pubescens* Kunth. By streams; rather rare; 5–6. III. i. East slopes Chair! ii. Waterfall Valley! Slopes towards El Saladillo! S. de Palma in Los Barrios district, *Rev.*

†*Rynchospora glauca* Vahl var. *pauciseta* Turrill in Journ. Bot. 1914, p. 14. Wet places; very local; 6. Cæspitose, with lax elongate inflorescence, on very long flaccid stems. An acquisition to the Flora of Europe. The variety also occurs in Algeria (sp. herb. Kew. labelled *P. laxa* R. Br.!). The type is widely spread. III. ii. Above Waterfall!

Carex divisa Huds. Sandy grassy places; frequent; 1–5. I. North Front! II.! III.! Rare north of San Roque.

C. vulpina L. Bushy places and by water; frequent or common; 3–6. II.! III.!

C. divulsa Good. Banks and bushy places; frequent; 3–5. I. Below St. Bernards. III.! Some forms look like *C. muricata* L., which is recorded from the neighbourhood by Pourret (*ex* Colm.), but I think ours is all *C. divulsa*.

†*C. paniculata* L. Swamps; locally common; 1–4. III. i. In most of the Cork Wood Sotos! Below S. Lorca!

C. distachya Desf. (*C. Linkii* Schk.). Dry bushy places; frequent? 2–4. Spikelets mostly androgynous, some female on long slender stems from base, utricles glabrous, stems 12–18 in., leaves $\frac{1}{4}$–$\frac{1}{2}$ line wide. I. Slopes below Middle Hill! Frequent on Windmill Hill!? Perhaps *C. Halleriana*. III. i. Queen of Spain's Chair! ii. Palmones Pinar! The species has been confounded with *C. ambigua*, *C. depressa*, and *C. Halleriana*. One of the four occurs in Cork Woods, Alcadeza and Herring Bone Crags, M. de la Torre, and in the Waterfall Valley!

†*C. ambigua* Link. Similar places; rare? 2–4. Like last but shorter and less erect, leaves $\frac{3}{4}$–1 line broad. III. i. Queen of Spain's Chair!

†*C. acuta* Fr. By streams; locally common; 3–4. III. ii. By Miel above Algeciras! Also, I think, in some neighbouring streams.

C. glauca Scop. Damp, usually clayey spots on hills; the type rare; 3–5. III. ii. Near upper aqueduct, Algeciras!

Var. *serrulata* Ball, with less exserted peduncles, and narrow fruit tapering at both ends, is common. III. i. and ii.!

C. pendula Huds. (*C. maxima* Scop.). Wet places in woods; locally frequent; 4–5. III. i. Cork Wood Sotos! ii. Mountains! Hills near Carnero Point!

C. hispida Willd. Damp places; frequent; 4–5. III.!
Var. *anacantha* G. & G. has very acute but hardly acuminate glumes. III. iii. Guadacorte Marshes! (1399).
†*C. depressa* Link (*C. basilaris* Jord.). Dry bushy places; rather rare; 2–4. Resembles *C. ambigua*, but spikelets all unisexual, and utricles slightly pubescent. III. i. Queen of Spain's Chair! ii. Hills above Algeciras, *Ball.* There is a specimen from Algeciras at Kew without collector's name!
C. Halleriana Ass. Similar places; rather rare; 2–4. Like last, but taller and more slender, with pubescent utricles. I. Mediterranean Road! III. i. Queen of Spain's Chair!
C. distans L. Marshy places; very common; 4–6. III.! C. B. Clarke unites this with *C. Hornschuchiana* Hoppe, which I think also occurs.
Var. *bætica* Auers. has green, not fuscous, glumes. III. i. About San Roque and Gibraltar, *Wk.* ii. S. de Palma, *Rev.*
†*C. binervis* Sm. Similar places; occasional; 3–6. Like last, but utricles with two strong green lateral ribs. III. i. Almoraima Soto! ii. S. de Luna, *Nilss.* iii. Guadacorte!
†*C. punctata* Gaud. Marshes; rare; 2–4. III. i. Soto Gordo!
†*C. extensa* Good. Marshes near sea; locally common; 4–6. III. ii. Palmones Playazo! iii. Palmones Marshes, a form with very remote lower spikelets!
†*C. lævigata* Sm. Damp woods and by streams; locally frequent; 3–5. III. i. Almoraima and other Sotos! ii. Mountains to top of El Frayle Ridge. Near Pelayo!

Gramineæ.

†*Leersia hexandra* Sw. Swamps; rare; 6–7. III. i. Spring above Pindalista! ii.? Near Algeciras, *Rev.* Probably same station as next. iii. Guadacorte Marshes!
Phalaris brachystachys Link. Cornfields; very common in Spain; 4–6. Annual, spikes about twice as long as broad, both scales below florets very short. I. Above Alameda! III.! Probably the species recorded by Masson as *P. canariensis* L.
P. minor Retz. Dry waste places; probably common; 4–6. Like last, but spikes longer, one scale below florets one-third length of pale. I. Reclamation Road! Near Willis's! III.!
P. paradoxa L. Cornfields; rather frequent; 4–6. Spikes usually half enclosed in upper sheaths, some or all spikelets aborted and indurated. III.!
P. cærulescens Desf. (*P. bulbosa* Cav. non L.). Damp clayey spots; common; 4–6. Tall, perennial, with bulbous root. III.!
Var. *major* Wk. (sub *P. bulbosa*) is the taller form, often 4 ft. or more!
Anthoxanthum ovatum Lag. Dry fields; abundant and very variable; 4–5. III.!
†*Phleum pratense* L. Dry fields; rare; 4–6. I. *K.* III. i. S. Carbonera, *D.*
†Var. *nodosum* Gaud. is decumbent, with swollen lower nodes

and short slender spikes. III. i. S. Carbonera, *D.* ii. North of El Cobre!

Crypsis aculeata Ait. Dry beds of pools; locally frequent? 6–8. Heads hemispherical or shortly oblong. III. iii. Excavations by railway!

Heleochloa (*Crypsis*) *schœnoides* Host. Similar places; rare; 6–8. Heads oblong or cylindrical. III. iii. Roadside excavation, Guadacorte!

Tragus racemosus Scop. Sandy and cultivated fields; rare; 4–6. III. i. Near Gibraltar, *Cabrera, Clem.*

Digitaria sanguinalis Scop. Cultivated soil; rare; 6. III. iii. Garden at Salt Pans!

**Paspalum Digitaria* Poir. Sandy shores; rare; 6. II. West shore!

Setaria verticillata P. de B. Cultivated soil; rare; 6–9. Awns with deflexed scabridity, setæ two. I. Alameda Gardens! and elsewhere, *D.* III. ii. Roadside near Algeciras Casino!

S. viridis P. de B. Similar places; rare; 6–7. Awns with erect scabridity, setæ several. III. i. Cultivated ground at San Roque, *D.*

Panicum repens L. Sandy ground; rather common; 5–11. I. North Front! II.! III.! A dwarf form, almost covered with sand, occurs in patches in sand dunes north of Linea!

Echinochloa Crus-Galli P. de B. Cultivated ground; frequent; 5–9. III. i. and ii.! iii.?

Andropogon distachyum L. Bushy ravines; rare; 4–9. III. i. Queen of Spain's Chair! Majarambout Crags! Alcadeza Ravine! ii. S. de Saladillo, *P. L.*

Cymbopogon (*Andropogon*) *hirtus* Stapf. Dry fields; abundant in Spain; 1–12, but chiefly 4–6. I.! III.!

Var. *longiaristatus* Wk. with awns 1 in. long or more, and sheaths glabrous below panicle, is as common as type!

†Var. *podotrichus* Hack. with spikelets longly villous above, the hairs on tubercles. III. ii. Algeciras, *Rev.*

†*Chrysopogon Gryllus* Trin. Dry places; rare; 6–7. Superficially like last, but spikelets ternate on many long slender branches from each node, in a denser panicle. I. *K.* III. i. Near Gibraltar, *Von Martius.*

Sorghum halepense Pers. Cultivated ground; occasional; 6–9. A stout broad-leaved species, with lax pyramidal panicle of subspiciform branches, leaflets with a broad white midrib. III. i. In maize fields by the Lajo! Railway near Second Venta! ii. About Algeciras aqueduct! iii. Gardens at Salt Pans!

Imperata cylindrica Pers. Grassy places; very local; 5–7. Panicle narrow, spiciform, becoming very white-silky. III. iii. Guadacorte Marsh!

Cynodon Dactylon Pers. Sandy grassy places; very common in Spain, less so on the Rock; 1–12, but chiefly 5–9. I. Scattered about lower levels! II. West shore! III.!

Spartina stricta Roth. Muddy salt marshes; local; 6–9. III. Near San Roque, *Masson*! Probably same station as next. ii. and iii. Guadarranque Marshes, both sides of river!

Arundo Donax L. Sandy places, partial to damp; common; but almost always planted for fences; 9–11. Glumes subequal, lower pale with long silky hairs below. [I. *K.*] III. In all subdistricts, but looking native only by R. Lobo!

Phragmites communis Trin. By shore and by rivers; rather frequent; 7–9. Glumes very unequal, lower pale glabrous. I. Sandy Bay! III. i. Along the shore! By the Lajo in many places. ii. By the shore! iii. Frequent by Aguacorte River and elsewhere! Often with barren shoots several yards long. *P. gigantea* J. Gay, 12–16 ft. high, is commoner in the province, and may have been confounded with it or with *Arundo Donax*. I have seen none of them in flower.

Ammophila arenaria Link. var. *arundinacea* Husnot (*Psamma australis* Mab.). Sand dunes; rather frequent; 5–6. More slender than type, with longer hairs at base of pales. II. East shore! III. i. Linea Sands! Near Campamento Common! Guadarranque! ii. Palmones Playazo! Sandy Bay! iii. Palmones Sands!

Agrostis Juressi Link. Grassy places; rare; 6. Aspect of *A. verticillata* but annual, panicle contracted, subinterrupted, branches naked in lower part, pales unequal, the lower as long as glumes. III. ii. S. de Palma, *Rev.* By the Miel above and below Waterfall!

A. Reuteri Boiss. Similar places; rare; 6–8. Perennial, panicle always very lax and slender. III. i. Campamento Common, behind Fernando's!

A. alba Schrad. Dry grassy places; occasional; 5–6. Perennial, leaves flat, panicle lax or narrow. III. i. About Campamento and San Roque!

Var. *gigantea* Mey. is a large form with larger laxer panicle. III. i. By the Cagancha in several places! Stream near Second Venta!

†Var. *fuscescens* Hack. has lanceolate acute glumes, becoming brown at maturity. III. ii. Algeciras, *Rev.*

†Var. *myriostachys* Hack. resembles *A. Reuteri*, glumes linear-lanceolate, deep brown. III. ii. Algeciras, *Rev.*

[Var. *densiflora* Parl. (*A. scabriglumis* B. & R.) is said to be frequent in the province.]

A. verticillata Vill. By streams; locally rather frequent; 5–8. Perennial, panicle dense, usually narrow, branches flowering to base, pales equal, shorter than glumes. III. i. Well in Linea! By Almoraima Station, with rather lax panicle! ii. Below Palmones New Bridge, a very large form! Above Waterfall, and elsewhere in the mountains!

A. castellana B. & R. Dry hill slopes; the type rare; 5–6. Like *A. alba*, but lower pale with two minute lateral awns, and, in the type, a dorsal awn. III. i. Near San Roque, *Ball*!

Var. *mutica* Hack. has lower pale awnless, and is the usual form. III. i. Queen of Spain's Chair! mixed with type. First Pine Wood! Campamento Common! ii. Waterfall Valley!

Var. *tricuspidata* Hack. is a form of the above. III. ii. Various places about Algeciras, *Rev.*

A. setacea Curt. Dry hill slopes; locally common; 5–8. Leaves quite setaceous. III. i. Summit of Chair! ii. Plentiful on slopes beyond the Waterfall!

A. pallida DC. Dry places; abundant; 5–6. Annual, with very lax pale green panicle, and only one pale. III.! A specimen from Porta & Rigo is labelled *A. Cupaniana.*

A. interrupta L. Sandy places; rare; 6–7. Annual, with narrow interrupted panicle, and very long awns. I.? *Clem.* Perhaps not on the Rock.

Sporobolus pungens Kunth. Sandy places near sea; rare? 7–9. Stem with many distichously set stiff leaves, one fertile flower. I.!? II.!? III. i. Linea, *D.* ii. Algeciras, *D.* iii. Palmones, *D.* Flowers too late for my observations, but I have seen leaves apparently of this species at the Lighthouse, on the Neutral Ground, and at the mouth of Palmones River. There may be confusion with *Æluropus* when not in flower, but inflorescence very different.

Gastridium lendigerum P. de B. Very common in cornfields, occasional in woods; 5–7. I. *K., Boiss.* III.!

Polypogon monspeliensis Desf. Damp and waste places; very common; 4–7. I.! II.! III.!

P. maritimus Willd. Similar places; frequent; 4–7. Usually smaller and reddish, glumes rather deeply bilobed. I. By Sentry Fence! Queen's Road, at 700 ft.! II.! III. i. Campamento Common! ii. Carnero Hills! Estuary by Reina Cristina, Algeciras! iii. Palmones Sands and Marshes!

Chæturus fasciculatus Link. Dry open places; locally common; 4–5. III. i. All round foot of Chair! iii. Guadacorte Marshes!

Lagurus ovatus L. Sandy, waste and gravelly places; very common; 4–6. I.! II.! III.!

Stipa tortilis Desf. Dry open hills; rather frequent; 4–5. I. Mediterranean Road, &c.! Europa Flats! Buena Vista! III. i. Cork Wood and Alcadeza Crags! Both sides First Pine Wood! Campamento Common! ii. Hills near Cortijo Trinidad! iii. Sands at Palmones, *Rev.*

Macrochloa tenacissima Kunth. Dry bushy hills and woods; local; 4–6. I. Abundant by Charles V.'s Wall and above Levant! occasional elsewhere! III. i. Cork Wood Crags! S. Carbonera! San Roque, *Masson.*

M. arenaria Kunth. Similar places; occasional; 4–5. III. i. East slopes Chair! Cork Woods! Alcadeza Crags! ii. Waterfall Valley!

Piptatherum cærulescens P. de B. Dry bushy slopes; very common on Rock, less so in Spain; 4–6. Ligule long, branches of panicle few, spikelets $3\frac{1}{2}$–4 lines, awn of pales not longer than glumes. I.! III. i. and ii.!

P. miliaceum Coss. (*P. multiflorum* P. de B.). Similar places; common; 5–6. Ligule short, branches of panicle many, spikelets $1\frac{1}{2}$–2 lines, awn of pales about twice glumes. I.! III.!

†Var. *Thomasii* (Kunth) has many of the lower panicle branches devoid of spikelets, but runs into type. I. Here and there mixed with type! III. ii. The prevailing form in the Waterfall Valley!

Airopsis globosa Desv. Sandy hills; rather rare? 4–5. Spikelets small, very globose. III. i. Between Pinar del Rey and Jimena, *Porta & Rigo*! perhaps beyond our limits. iii. Between Algeciras and San Roque, *Winkl.*

†*Antinoria agrostidea* Parl. Sandy turfy fields; locally abundant; 3–4. A short cæspitose perennial, spikelets small and short, one floret sessile, the other stipitate, glumes dark, longer than florets. III. ii. Pastures near El Cobre! iii. Los Barrios Aviation Ground! I believe also in i., but no definite record.

Molineria minuta Parl. Similar places; rare? 3–4. Annual, panicle very lax, lower pale many-nerved, keeled, glumes shorter than florets. III. i. Gibraltar, *Cabrera, Clem.* Doubtless the neighbourhood is meant. Pinar del Rey, *Porta & Rigo*! labelled *Aira lendigera* Lag. var. *mutica* Boiss.

Var. *bætica* Wk., with hairs at base of lower pale as long as the pale, is the commoner form in the province. III. ii. Near Algeciras, *Hack.*

†*Aira caryophyllea* L. Sandy fields and open woods; rather rare; 4–5. III. i. San Roque, *Masson*! Cork Woods above San Roque, *Boiss.*! ii. S. de Palma, *Porta & Rigo*! labelled *Periballia hispanica.*

†*A. multiculmis* Dum. Similar places; rare; 4–5. Distinguished from last by its clustered spikelets. III. i. Cork Wood Crags! form with one-awned spikelets. There are two sheets at Kew from Boissier and Reuter, one labelled *A. capillaris* Host., the other *A. multiculmis* Dum., both "Gibraltar," which belong here. They probably come from San Roque, not from the Rock.

A. elegans Gaud. Dry sandy and stony places; frequent, at least locally; 4–6. Panicle large and very lax, only one flower awned. III. ii. M. de la Torre! Plentiful in Waterfall Valley!

[Var. *biaristata* G. & G., with both florets awned, is common in the province.]

Corynephorus canescens P. de B. Sandy ground; local; 5–6. Perennial, in compact tufts, apical portion of awn gradually enlarged upwards, anthers 3–4 times as long as broad. III. i. Cork Woods near San Roque, *Boiss.* iii. Palmones Sands! (1080 and 2072).

†*C. fasciculatus* B. & R. Sandy ground; occasional; 4–5. Annual, in lax tufts, awn as last, anthers quadrate. II. *D.* III. i. Linea, *D.* Pine Woods near San Roque, *B. & R.*

C. macrantherus B. & R. Similar places; occasional; 4–5. Like last, but spikelets larger, in larger denser fascicles, apical portion of awn abruptly enlarged upwards, anthers linear. III. i. San Roque, *Boiss.* Near Soto Gordo! (2146). Almoraima, *Porta & Rigo*!

Deschampsia flexuosa Griseb. Grassy places in mountains;

rare; 6–7. III. i. Queen of Spain's Chair! ii. Mountains beyond Waterfall! (2259). Dr. Stapf has only seen the latter specimen, which he considers inseparable from type.

Var. *orophila* Hack. has a denser panicle with less spreading branches. III. ii. Summit of S. de Palma, *Rev.* Probably same station as mine.

Avena sterilis L. Dry fields and waste places; frequent; 4–6. Spikelets much larger than in next, only one floret disarticulating. I. Thinly scattered! III. i. and ii.!

[Var. *maxima* P. L., a stout form, and var. *scabriuscula* P. L., a more slender one, with lower part of awn scabrid, not villous, are said to be as common as type in province.]

A. barbata Brot. Similar places; common; 4–6. All florets disarticulating. I.! III. i. and ii.!

A. sulcata J. Gay. Rough bushy places; rare; 4–6. Lower pale with 5–7 strong nerves, glabrous, with a tuft of hairs at base as long as pale. III. ii. S. de Luna, *Winkl.*

A. albinervis Boiss. Similar places; locally frequent; 4–6. Lower pale much less strongly nerved, hairy in lower third. III. i. Queen of Spain's Chair! Majarambout Crags! Almoraima, *Porta & Rigo*! labelled *A. bromoides* var. *microstachya* Wk. ii. Slopes beyond Waterfall!

A. bromoides Gouan. Similar places; rare; 5–6. I. Mediterranean Steps! Willis's!

†*Arrhenatherum elatius* M. & K. Dry bushy places and woods; frequent? 5–6. III. i. Near San Roque, *Brouss.* ii. Near Algeciras, *Rev.* iii. At Palmones, *Rev.* Perez Lara has not seen this or the variety in the province, and suspects that the next species may have been mistaken for it.

†Var. *bulbosum* Gaud. differs only in the base being swollen into one or more superposed bulbs, and is the only form I have seen. III. i. Queen of Spain's Chair, frequent! ii. About the Waterfall!? Perhaps *A. pallens* has been mistaken for it in the last station.

A. erianthum B. & R. Similar places; rare, but common elsewhere in the province; 4–6. Differs from last in larger spikelets, awn produced from base instead of from middle of pale, and perfect floret longly hirsute all over except at apex. III. ii. Below Waterfall!

†*A. pallens* Link. (*A. Thorei* Duby). Similar places; local; 5–6. Spikelets smaller, both florets usually fertile, awn above middle of pale. III. ii. Mountains above Algeciras, *B. & R.*! Waterfall Valley! S. de Palma, *Winkl.*

Trisetum Dufourei B. & R. Sandy fields and woods; occasional; 4–5. Ligule a ring of hairs, spikelets 2-flowered, awn 2–3 times as long as setæ of pale. III. i. Sandy woods near San Roque, *B. & R.*! Cork Woods! ii. Palmones Pinar! (959 and 1907). Probably Reverchon's "near Palmones River." iii. Lane from Guadarranque to Guadacorte!

Var. *lasianthum* P. L. has a very short lacerate ligule, not reduced to hairs, larger 3-flowered awnless spikelets, and more

villous very acute glumes. III. i.? Near Gibraltar, *Boiss.* ii. Near Algeciras, *Hack.* Palmones Pinar ! (937).

Koeleria panicea Domin (*Trisetum neglectum* Kunth). Sandy and grassy places; very common; 4–6. Sheaths villous, panicle 1½–4 in. Looking like a lobed *Polypogon*. I.! II.! III.!

†*K. pumila* Domin (*T. pumilum* Kunth). Similar places; much less common; 5–6. Sheaths puberulous, panicle spiciform, ½–1 in., awn shorter than in last. I. Above Willis's! (1049). III. Probably common, but confounded with last.

K. phleoides Pers. Grassy and gravelly places; very common on Rock, rare in Spain; 4–5. I.! III. i. By Lajo below Almendral! iii. Guadacorte ! Palmones, *Rev.*

†Var. *brachystachya* Domin is a dwarf form. I. Gibraltar, *Von Martius*. I think common on gravel paths, as on Queen's Road near Michael's !

†*K. Salzmanni* B. & R. var. *valdepilosa* Domin (*K. phleoides* var. Hack.). Sandy ground; very local; 5. III. ii. Palmones Pinar ! (939). Probably Reverchon's "Palmones" station.

†*Holcus grandiflorus* B. & R. Bushy places in open woods; locally common; 5–6. III. ii. Slopes above and below Waterfall!

H. lanatus L. Grassy places; common; 5–8. Not creeping, awn hooked at tip, scarcely exserted. II.! III.!

Var. *argenteus* Hack. non Lge., less puberulent, often subglabrous, is as common and probably the prevailing form. III. i. San Roque, *Boiss.* ii. Waterfall Valley !

†Var. *tuberosus* Ball. Rhizome subtuberous. III. i. San Roque, *Ball.*

H. mollis L. Similar places; rare; 5–8. Stoloniferous, awn straightish or curved, longly exserted. III. i. Near San Roque, *Brouss.* ii. Marshy spot in valley beyond Waterfall!

Glyceria fluitans R. Br. Wet ditches; occasional; 4–6. III. i. Lajo Valley ! Almoraima Station ! ii. Roadside at Algeciras Bull ring! Gardens at Palmones Pinar! ii. Gardens at Salt Pans ! Seen elsewhere, but no precise stations noted.

[Var. *plicata* Griseb., with shorter spikelets and florets, is frequent in the province.]

†*G. loliacea* Godr. Similar or drier places; rare; 4–6. Resembles *L. perenne*. III. i. Near Gibraltar, *Amo.*

†*Atropis iberica* W.-Dod in Journ. Bot. 1914, p. 14. Tidal rivers; locally common; 5–6. III. ii. and iii. Palmones River, both sides, about the bridges !

A. sp. My 1069 from the salt marshes near the stone bridge in Guadarranque Marshes is probably a new species allied to *A. festucæformis* Richt. The material is not sufficient to diagnose.

†*Schismus marginatus* P. de B. (*Festuca calycina* L.). Sandy places; rare; 4–6. I. *K.* III. i. Near Gibraltar, *Von Martius.*

Poa annua L. Grassy places, roadsides, &c.; very common; 1–12. I.! II.! III.!

P. bulbosa L. Similar places; occasional; 3–5. Perennial, with a bulbous root and glaucous foliage. III. i. Queen of Spain's

Chair! Campamento Common! Pine Wood Plains! ii. Hills south of Algeciras! Mountains behind Saladillo!

P. trivialis L. Damp and clayey places; common; 4–6. II.! III.!

Briza minor L. Grassy places; very common in Spain; 5–6. I.? *K.* No confirmation. III.!

B. maxima L. Similar places; very common in Spain, frequent on the Rock; 5–6. I.! III.!

Melica minuta L. (*M. aspera* Desf.). Rocky and stony places; common on the Rock, less so in Spain; 4–6. The type is usually short, up to 12 in., with rather small subsimple panicle, and involute leaves, but it varies greatly. I.! III. i. Queen of Spain's Chair! ii. Carnero Hills! Waterfall Valley!

Var. *arrecta* (Kunze) has more erect panicle branches, and more unequal glumes, the outer longer than the florets. I. East slopes among *Chamærops*, *Wk.*! Middle Hill! (483).

Var. *latifolia* Coss. (*M. major* Sibth. & Sm.) is much taller, with broad flat leaves and a large panicle. It is the form of bushy places. I.! III. ii. Waterfall Valley! S. de Palma, *Rev.*

Var. *pyramidalis* (Bertol.) has a spreading pyramidal panicle. I.!

†*M. ciliata* L. Similar places; frequent on the Rock, occasional in Spain; 4–6. Panicle spiciform, lower pale longly silky. I.! III. i. San Roque, *Masson*!

Var. *major* Ball (*M. Magnolii* G. & G.) is a large form with lobate and interrupted panicle. I. Above Willis's! Probably elsewhere. III. i. West slopes Chair! ii. Carnero Hills!

[*M. nutans* L. is reported near Gibraltar by Cabrera (*ex* Colm.).]

Cutandia (*Sclerochloa*) *maritima* Benth. Sand dunes near the sea; rather local; 4–6. Spikelets and panicle branches often divaricate, pales very acute, keeled. I. Beyond Catalan Bay! II. East shore! III. iii. Palmones Sands!

Scleropoa (*Desmazeria*) *loliacea* G. & G. Roadsides and waste places; locally frequent on the Rock; 4–6. Panicle compact, with erect subsessile spikelets, pales obtuse, not keeled. I. Governor's Cottage! Catalan Bay! Glacis! III. ii. Algeciras, *Winkl.*

S. rigida Griseb. Similar places; common; 5–6. Panicle smaller, rigid, with spreading pedicellate spikelets, pales as last. I.! III. i. and ii.!

Æluropus (*Dactylis*) *littoralis* Parl. Sandy shores; occasional? 5–8. Leaves many, short, stiff, distichous, spikelets 5–11-flowered in a lobulate spiciform panicle. I. *K.* III. i. Between Gibraltar and San Roque, *D.*

†*Dactylis glomerata* L. Rough bushy places; very common; 5–7. A most variable species, of which the type has not hitherto been recorded. I.! III. i. and ii.!

Var. *australis* Wk. (*D. hispanica* Roth.) is shorter, with a denser subsimple panicle, lower pale with deeper, rounded, not acute lobes, with shorter mucro. It is as common as type. I.! At foot of Gibraltar, *Salzm.*! III. ii. Waterfall!

[Var. *juncinella* Boiss. is a smaller, more slender variety, with more puberulent, emarginate lower pale, and is, I believe, frequent.]

Danthonia decumbens DC. Chiefly in watercourses on mountains; locally frequent; 4–6. III. i. Queen of Spain's Chair! ii. Frequent in mountains!

Molinia cærulea Moench. Watercourses; local; 7–8. III. i. North-east slopes Chair! ii. Valley beyond Waterfall!

Cynosurus echinatus L. Bushy slopes; common; 5–6. I.! III.!

C. elegans Desf. Similar places; very local; 5–6. III. ii. At the Waterfall!

Lamarckia aurea Moench. Roadsides, walls, and waste places; rather frequent; 3–5. I. Walls in the town! Dockyard! Engineer Road! III. i. Campamento village! ii. Walls in Algeciras! iii. Palmones village!

Vulpia Myurus Gmel. Grassy and rough places; frequent? 4–5. Leafy to top, panicle long and narrow, upper glume not awned. III. i. and ii.!

V. sciuroides Gmel. Similar places; common; 4–5. Stem longly naked at top, panicle short, dense. Not always easily distinguishable from last. III. i. and ii.!

Var. *longearistata* Wk. (*V. Broteri* B. & R.) has more numerous florets, and a longer awn to lower glumes. III. i. Almoraima, *Boiss.* San Roque, *D.* ii. S. de Palma, *Rev.*

V. ciliata Link. Sandy places; rare? 4–5. Panicle long and narrow, silky-villous, partly enclosed in uppermost sheath, pedicels very short, lower glume not more than one-fifth as long as upper, pales longly ciliate. I. *K.* II. On the Isthmus, *Wk.*! III. i. S. Carbonera, *D.* Almoraima, *Wk.*

V. uniglumis Dum. Similar places; rare (but abundant in the province *P. L.*); 4–5. Both glumes awned, the lower one-tenth as long as upper or less. Habit of *Bromus madritensis*. III. i. Near Gibraltar, *Von Martius*.

V. geniculata Link. Stony and rough places; very common; 4–5. Very variable, I have seen it 4ft. high by the Lajo. I.! *Masson*! III.!

†Var. *conferta* Coss. & Germ. is a dwarf condensed form. I. Europa Flats!

V. Alopecurus Link. Sandy ground; very common; 4–5. Spikelets on shorter pedicels, larger, and with more numerous florets than in last. I. Cave Guard, *K.* II.! III.! Near Gibraltar, *Salzm*! *Masson*!

Var. *lanata* Boiss. with subsimple raceme and very silky-villous pales seems as frequent as type. II.! III.!

†Var. *sylvatica* Boiss. has elongate strict raceme, spikelets with 7–9 florets, and awn twice as long as pale. III. i. Cork Woods above San Roque, *Boiss.* I believe I have gathered this by the Lajo below Second Pine Wood.

Festuca ampla Hack. Grassy hills; rare; 5–6. Cæspitose, slender, leaves flaccid, setaceous, convolute. III. i. Queen of

Spain's Chair! (2157). Found there also by Reuter, *teste* Hackel.

†*F. montana* M. Bieb. var. *altissima* Hack. (*F. exaltata* Wk. non Presl.). Stony slopes; very local; 6–7. A very large and tall species. III. ii. At and above Waterfall! Hackel and Reverchon have also found it there.

F. cærulescens Desf. Stony and bushy slopes; locally common; 4–6. Stem-leaves flat, the radical often setaceous, densely covered at base of stem with remains of old sheaths. III. i. S. Carbonera, *Hack.* Majarambout Woods! ii. Plentiful slopes beyond Waterfall!

F. arundinacea Schreb. var. *mediterranea* Hack. Damp clayey spots; frequent; 4–6. Awn frequently not terminal. I. Europa Glacis, on dry rocks, rare! III. i. Marshy ground near Pindalista! (1195). iii. By Los Barrios Station! (2064). Seen in many other places, but doubtful between this variety and next.

Var. *Fenas* Hack. (*F. interrupta* Desf.) is probably as frequent as last. III. i. Lajo Valley near upper ford! Gibraltar, *Fritze.* Almost certainly in this subdistrict.

Bromus tectorum L.? Rocky slopes; rare or error; 4–6. Panicle drooping, rather dense, spikelets smooth, awn about as long as pales. I.? *D.* Not confirmed.

B. sterilis L. Rough grassy places; occasional? 4–6. Very like *B. maximus* var. *Gussonei*, but decidedly smaller, with shorter awns. I. Reclamation Road! Charles V.'s Wall! and probably elsewhere. III. ii. El Cobre! Doubtless much more frequent than these records show.

B. maximus Desf. Sandy ground; common; 3–5. The type has pale green very shortly pedicelled spikelets, with very long awns. Either this or the next species is common, but their differences are obscure, and the two have been much confused. I.! Specimens from Catalan Bay (884 and 1157) have fascicled bulbs at the roots, but Dr. Stapf thinks they are only a state of the type. III.!

Var. *Gussonei* Parl. is much more diffuse and lax, resembling *B. sterilis.* It appears to be the commoner form, at least in Spain. III.!

†Var. *glaber* Wk. is a dwarf, few-flowered variety, with glabrous and shining spikelets. III. i. Near Gibraltar, *Wk.*

B. madritensis Desf. Similar places; frequent? 3–5. Smaller than last with shorter awns, spikelets usually purple. I. *Brouss!* Willis's Road! III. No actual records, but it certainly occurs, and is abundant in the province.

Var. *ciliatus* Guss. has a dense subthyrsoid panicle, with softly pubescent, not scabrid glumes. I. Catalan Bay!

B. rubens L. Similar places; occasional; 3–5. Panicle denser, rigid, reddish, spikelets subsessile. I. South and west slopes, *K.*, *D.* III. i. San Roque, *Boiss.*

†*Serrafalcus commutatus* Godr. Grassy places, partial to shade; occasional or frequent; 4–6. Panicle large and lax, often drooping, pedicels long. III. i. Almoraima Soto! ii. Hills south of Alge-

ciras! iii. Guadacorte Marshes! and probably many other places.

S. hordeaceus G. & G. (*S. mollis* Parl.). Grassy places; very common in Spain, occasional on the Rock; 4–6. I. Above Alameda! Buena Vista! By North Front Cemetery! II.! III.!

Var. *leiostachys* M. & K. is a glabrous form. III. iii. Palmones Marshes!

Var. *contractus* Lge.? has a compact panicle with short pedicels. III. i. Pedrera!

S. Cavanillesii Wk. (*Bromus scoparius* L.). Sandy ground; rare; 4–6. Panicle very dense, awns long, divaricate. III. ii. Algeciras, *Winkl.*

S. squarrosus Bab. Sandy and cultivated fields; rare; 5–6. Panicle very lax, spikelets pendulous, lanceolate, with very divaricate awns. III. i. Near San Roque, *Brouss.*

S. macrostachys Parl. Similar places; frequent; 5–6. Like last, but panicle and spikelets erect, the latter larger and broader. III.

Var. *brevispicatus* Boiss. has smaller more simple panicle. III. i. By watercourses, Campamento Common!

Hordeum murinum L. Sandy and waste places; very common; 3–5. I.! II.! III.!

Var. *major* Boiss. with inner glumes of sterile spikelets ciliate on both sides, appears common. I. Rosia! III.!

H. maritimum With. Dry sandy and clayey spots; very common, often far inland; 5–6. I. Grassy rocks, *D.* II.! III.!

H. bulbosum L. Chiefly by dry watercourses; very common; 5–6. III.!

Ægilops ovata L. Dry grassy and sandy places; very common, except on Rock; 4–6. I. Windmill Hill! Europa Flats! Governor's Cottage! III.!

Æ. triaristata Willd. Similar places; much less common; 5–6. Spikes larger, awns much longer, more erect, those of lower pale very unequal. III. i. Campamento Common! By Lajo below First Pine Wood! ii. About San Bernabe! iii. About Palmones Bridge! Guadacorte! and elsewhere.

Æ. triuncialis L. Similar places; occasional; 5–6. Spikes linear, awns very erect. III. i. Campamento Common! Lower slopes Chair! Almoraima! iii. Aguacorte! Guadacorte! No record for ii., but it doubtless occurs.

Agropyron junceum P. de B. Sandy shores; locally frequent; 6–7. I. Governor's Cottage! North Front Butts! Catalan Bay! Here forms are found with leaves flat, 1½–3 lines broad, or involute, 1–1¼ lines when flattened. They look very different. II.! III. i. Sands near La Tunara! iii. Palmones Sands!

A. elongatum P. de B. Muddy salt marshes; rare; 6–7. A stout, stiff, erect species, with large spikelets. III. iii. Guadarranque Marshes!

†*A. campestre* G. & G. Sandy grassy places; frequent; 6–7. A very glaucous species, like a slender *A. repens*. III. i. and ii.!

[*A. repens* P. de B. is abundant in the province.]

Brachypodium sylvaticum R. & S. Woods and bushy places, chiefly in mountains; frequent; 5–8. III. i. and ii.!

B. ramosum R. & S. var. *phœnicioides* Koch (*B. pinnatum* var. *australe* G. & G.). Bushy and stony places; frequent or common; 5-7. Forms dense mats of barren shoots, sometimes a foot thick and three or four broad. I. Above Alameda! Plentiful on southern slopes! III.!

B. mucronatum Wk. Rough stony slopes; locally common; 5–7. In small tufts, with few or no barren shoots. III. ii. Slopes beyond Waterfall!

B. distachyum P. de B. Grassy places; frequent; 4–6. Annual, not perennial, as the last two. I.! II.! III. i. and ii.!

Var. *pumilum* Wk. is a reduced form with 1–2 spikelets, each 5–10-flowered. I. Catalan Bay!

Var. *multiflorum* Wk. has 4–5 spikelets, each 12–24-flowered. III. i. Campamento Common!

Lolium perenne L. Sandy fields; very common; 4–6. I.! II.! III.!

Var. *tenue* Coss. & Germ. is a slender form, with 3-4-flowered spikelets. II. *K.* III. i. Sand Desert, *D.*, *Salzm.*

L. multiflorum Lamk. (*L. italicum* A. Br.). Grassy and sandy places; occasional? 4–6. Spikelets awned, usually annual. III. i. By upper ford on Lajo! I think in many other places, but have no definite records.

L. rigidum Gaud. (*L. strictum* Presl). Sandy and grassy places; rather frequent; 5–6. Spikes very rigid. I. Catalan Bay! A tall erect form like *L. perenne.* III. i. Almoraima! Pindalista! Alcadeza Crags! iii. Guadacorte! All decumbent forms, with curved subcylindrical spikes.

L. temulentum L. Sandy places and cornfields; locally frequent; 4–6. III. i. Campamento Common! Bonel's Farm! First Venta! Common north of San Roque! ii. Occasional!

Var. *macrochætum* A. Br. is a long-awned form. III. i. By San Roque Bull Ring! &c.

Gaudinia fragilis P. de B. Grassy places; very common; 5–6. A form with glabrous spikelets occurs frequently. III.!

Nardurus tenellus Reichb. Sandy and cultivated fields; rare; 5–6. A slender annual, with unilateral spikes. III. i. San Roque, *Brouss.*

Lepturus incurvatus Trin. Sandy ground; rare? 5–6. Glumes two. III. i. Sea sand near Gibraltar, *Salzm*!

L. filiformis Trin. Similar places; frequent or common; 5–6. Very near last, but spikes straighter, spikelets not longer than internodes, and glumes not longer than spikelets. II.! III.!

L. cylindricus Trin. By paths and in cornfields; rare? 5–6. Glumes solitary. III. i. Gibraltar, *Salzm*! Probably in the neighbourhood. ii. Algeciras, *Rev.*

EQUISETACEÆ.

Equisetum Telmateia Ehrh. Chiefly damp bushy places in

woods, but not confined to them; frequent; 2–3. III. i. and ii. !

E. ramosum Schl. Dry sandy places and cornfields; very common; 3–5. I. *Lem.* III. ! This is doubtless the species referred to by Kelaart (Fl. p. 187) as *E. hyemale.*

[*E. hyemale* L. Sandy banks; very local, or error; 3–5. III. i. Abundantly by a tributary of the Guadarranque, *K.* Probably the Lajo is meant, where the last species is abundant.]

Isoeteæ.

†*Isoetes bætica* Wk. In pools; rare; 6. III. i. Rare in pools at Almoraima, *Wk.*

Lycopodieæ.

Selaginella denticulata Sprg. Rough slopes and rocky places among bushes; very common; 2–4. I. ! III. i. and ii. !

Filices.

Gymnogramma leptophylla Desv. Bushy and stony places; very common; 3–5. I. ! III. i. and ii. !

Ceterach officinarum Willd. On rocks, partial to limestone; 11–5. I. ! III. i. Alcadeza Crags ! Long Stables Ravine !

†*Notochlæna Marantæ* R. Br. Similar places; rare; 4–5. Resembling last, but fronds much larger and bipinnate, glabrous above. III. ii. Algeciras Mountains, *Clem.*

†*N. vellea* R. Br. (*N. lanuginosa* Kaulf.). Similar places; rare; 11–3. Smaller than last, woolly both sides. I. *Lem.* ! *Boiss.*, *Née.*

Polypodium vulgare L. Rough rocky places, often on tree trunks; rather locally common; 8–3. I. St. George's Hall ! Mediterranean Steps ! III. i. Queen of Spain's Chair ! Cork Woods ! Alcadeza ! ii. Common in mountains !

Var. *serratum* Willd. has lobes of frond serrate. I. Mediterranean Steps ! III. i. San Roque, *Wk.* ii. Algeciras, *Wk.*

Cheilanthes odora Sw. Under rocks and bushes; rare; 2–5. I. About Michael's ! Below Spur Battery ! III. i. East Slopes Chair ! ii. Waterfall !

†*Polystichum Thelypteris* Roth. Streams and marshes; locally frequent; 7–10. III. i. S. Lorca ! Cork Wood Sotos !

P. Filix-mas Roth. Woods; rare; 6–9. III. ii. Cuartel de las Corzas, *P. L.* S. de Palma, *Rev.*, *Clem.*

Cystopteris fragilis Bernh. Shady slopes on mountains; rare; 6–9. III. I. San Roque, *D.* ii. S. de Luna, *P. L.* S. de Palma, *Clem.*

Asplenium Filix-fœmina Roth. Damp places in woods; locally common; 6–8. III. i. Cork Wood Sotos ! ii. Mountains !

A. lanceolatum Huds. Dry, but shady rocks; locally common; 4–9. III. i. Summit of Chair ! ii. Mountains !

A. Trichomanes L. Similar places; common on the Rock, less so in Spain; 4–9. I. ! III. i. Alcadeza Crags ! Long Stables ! S. Carbonera, *D.* No record for ii. where it certainly should occur.

A. Adiantum-nigrum L., var. *Virgilii* Heufl. Bushy and rocky places, chiefly in woods; frequent; 4–9. Only the variety is recorded, which differs from type in narrower, more spreading, more deeply incised segments, and much longer linear sori, but I think type is common. I. *K.*, *D.* I have no note of having seen it on the Rock, but think it is an accidental omission. III. i. Cork Woods! ii. Plentiful in mountains! Carnero Hills!

Scolopendrium Hemionitis Cav. Damp caves; very local; 2–5. I. Michael's Cave, *Clem.*, *K.*, *D.* In a cave on east slopes! Below Governor's Cottage, *K.*

Blechnum spicant Roth. Damp rocky places in woods; local; 6-8. III. ii. In and about Waterfall Valley, and a valley north of it!

Pteris aquilina L. Dry sandy places; very common, except on the Rock; 7–9. I. A starved plant or two growing through the concrete of a water chute just beyond the Mount! III.!

Adiantum Capillus-Veneris L. Damp rocks and by watercourses; frequent in Spain, rather rare on the Rock; 6–7. I. Lower Union Gallery! Cave above North Front! Caves on eastern shore, herb. *Balestrino*! Below Mediterranean tunnels! The Rock form has much larger fronds than that from the country round. III. i. and ii. Scattered over these subdistricts!

Davallia canariensis Sw. On tree trunks and rocks; locally very common; 3-9. [I. *K.*, but obviously in error.] III. i. Cork Woods! ii. Mountains!

Osmunda regalis L. By streams; locally common; 5–9. III. i. Soto Gordo! Almoraima Soto! ii. Waterfall and other valleys!

Ophioglossum lusitanicum L. Sea sand; rare; 1–3. III. ii. Algeciras, *Clem.*

APPENDIX

Additional Species and Varieties.

P. 5. Last line but three should read "*Hesperis matronalis* Lam. var. *laciniata* Boiss. (*H. laciniata* All.). Rocky places; rare; 4–5. I. *Lem.*!"

P. 28. *Medicago obscura.* Add "*f. muricata* Urb., a spiny-fruited form, is reported by Colmeiro from III. ii. Algeciras."

P. 31. After *T. lappaceum* insert "*T. carteiense* de Coincy in Journ. de Bot. xiii. p. 163 is recorded by its author as a new species from the Carteian Hills. I do not know it, but it seems near *T. lappaceum.*"

P. 55. After *Anthemis maritima* insert "*Ormenis nobilis* J. Gay. Sandy heaths; rare; 5–9. Resembles next, but perennial. III. i. Near Gibraltar, *Clem.*"

P. 57. Before *Phagnalon saxatile* insert "*Phagnalon sordidum* DC. Rocky places; rare; 4–6. Known from next by adpressed phyllaries. I.? *Lag.* III. ii. Algeciras, *Née.*"

P. 63. After *Hyoseris radiata* and details insert "var. *elongata* Huet de Pav. Achenes with an inner pappus of 2–3 setæ, the marginal winged. I. Fissures of Rock, *Wk.* III. i. Walls of San Roque, *Wk.*"

P. 66. After *Crepis corymbosa* var. *bætica* insert:—

"*Andryala ragusina* L. Dry bushy hills; rare; 5-7. III. i. Near San Roque, *Boiss.* ex *Colm.*

Var. *minor* Lge. III. i. With the type, *Brouss.* ex *Colm.*"

P. 77. Add "[*Chænorrhinum origanifolium* L. is recorded by Willkomm in Bot. Zeit. 1845, p. 742, as found by him on the Rock, but he enters it from N. Spain only in Prodr. Fl. Hisp.]"

P. 79. After line 17 add "*Pedicularis lusitanica* Hoffm. & Link. Damp spots in bushes and by watercourses; occasional; 3–5. III. i. Queen of Spain's Chair! ii. Mountains! iii. Palmones, *Rev.*

P. 80. Before *Orobanche minor* insert "*O. variegata* Wallr. III. i. Top of Chair! Not previously recorded for Spain."*

P. 80. Before *O. Picridis* insert "*O. Hænseleri* Reut. var. *deludens*,* var. nov. Filamentis paulo supra basim insertis, corollæ lobis copiose glanduloso-pilosis, acriter et longius dentatis. Beck MS. III. ii. Waterfall (my 370)!"

P. 80. Before *O. minor* insert "*O. Hederæ* Duby. III. ii. Near Almoraima!"

* The determinations of some of my Orobanches were received from Prof. Beck too late for insertion in their place.

P. 84. Add "[*Phlomis tuberosa*, reported by Boissier (Voy. p. 70) from near the Galleries on the Rock, is probably meant for *Nepeta tuberosa*, which occurs there.]"

Corrections.

P. 1. *Nigella damascena.* Delete "?" after I. and under II., after K. add "*Rev.*" and delete "probably same station." Debeaux's citation is quite misleading.

P. 5, line 1. For "smaller" read "larger."

P. 22. *Ruta bracteosa.* Remove "?" after I. Erase remarks after *K.* and add "*Boiss.*"

P. 26. Erase II., and for "Neutral Ground" read "North Front."

P. 34. *Lotus angustissimus.* Add "?" Delete "Young examples—here," and substitute "Probably the next has been mistaken for it." Delete "*Boiss.*" who only records it from "between San Roque and Estepona," probably beyond our limits. Debeaux's citation is, as in many cases, misleading. He may have seen a specimen of Boissier's from Algeciras, but I have no confirmation.

New Stations.

With the exception of the first named, and of the Orobanches, only those previously unrecorded for their districts are given:—*Delphinium Staphisagria.* I. *Hurst*! *Fumaria macrosepala.* III. ii. *B. & R. Cistus albidus.* III. ii. *Lag. Tuberaria echioides.* III. iii. *Rev. Drosophyllum lusitanicum.* III. iii. *Rev. Silene littorea.* III. iii. *Fritze, Winkl. Arenaria emarginata.* III. iii.! *Cerastium Boissieri.* III. ii. *Von Martius. Spergula arvensis* var. *glutinosa.* I. *Lem. Lavatera trimestris.* I. *Boiss., K. Ononis pubescens.* III.! *Lathyrus sativus.* I. *K. Myrtus communis.* I. *Tournef., Ayala. Lythrum Græfferi.* I. *K. Bupleurum gibraltaricum.* III. ii. *Vahl. Helminthia comosa.* I. *K.*! *Andryala arenaria.* I. *Boiss., Wk. Jasione montana* (type). III. i. *Boiss. Jasminum fruticans.* III. i. *Schott. Calystegia Soldanella.* I. *Ayala. Echium italicum.* III. i. Navarro, *Pourr. Symphytum tuberosum.* III. i. *Von Martius. Linaria viscosa.* III. iii. *Rev.*

Orobanche fœtida f. *pusilla* Beck. I. Above Willis's! III. ii. Hills near San Bernabe! *O. sanguinea* Presl. I. Above Willis's! Stigmas yellow in my specimens; Beck describes them as red. *O. Picridis* F. Schultz. III. ii. Palmones Playazo! "*ad minorem* transiens," *Beck.* Palmones Pinar! Var. *Carotæ,* Beck. I. Levant! *O. minor* Sutt. I. Ince's Farm! Above Devil's Gap!

Plantago Lœflingii. III. i. *Von Martius.*

Doubtful Stations.

There is no satisfactory evidence that their collectors intended to specify the Rock, as distinct from the neighbourhood, for the following, which are therefore doubtful records for I.:—*Malcolmia lacera. Linum gallicum. Astragalus Epiglottis. Ornithopus*

roseus var. *isthmocarpus*. *Lathyrus angulatus*. *Daucus crinitus*. *Galium divaricatum*. *Kentrophyllum bæticum*. *Campanula dichotoma*. *Lithospermum fruticosum*. *Linaria cirrhosa*. *L. triphylla*. *Lafuentea rotundifolia*.

Doubtful Names.

The following names are doubtful. Where "I." is added, the doubt is as to the correct identification of the species for the Rock, though they may exist elsewhere:—*Erodium Jacquinianum* and var. *bipinnatum*. *E. Salzmanni*. *Ulex aphyllus*. *Ononis diffusa* I. Governor's Cottage. *O. Natrix* var. *media* I. *Medicago turbinata* var. *aculeata* I. *M. coronata*. *Fœniculum officinale* I. *Artemisia pontica*. *Senecio leucanthemifolius*. *Cynara Cardunculus*. *Thrincia maroccana* I. *Andryala laxiflora*. *Erythræa Centaurium* I. *Solanum villosum* I.

Alterations of Status.

Remove † from *Velezia rigida* and add to *Opoponax Chironium*.

Remove [ ] from district cited or from the whole species if no district is here indicated. *Retama monosperma* I. (Several old records exist.) *Ridolfia segetum* I. (Doubtless a former weed of cultivation.) *Echium italicum*. *Symphytum tuberosum*. *Plantago Lœflingii* (except I.).

Add [ ] to *Senecio petræus* and to district I. for the following:—*Brassica fruticulosa* (erroneous record). *Anthemis arvensis* (casual). *Senecio petræus*, *Carduus nigrescens* and *Helminthia echioides* (wrong determinations). *Anarrhinum bellidifolium*. (Von Martius does not record this species as stated by Kelaart, but he does record *A. tenellus*, doubtless in error for *Chœnarrhinum villosum*.)

Add * to *Solanum sodomæum*. *Amaranthus chlorostachys*. *Chenopodium ambrosioides*.

Deletions.

Silene cerastioides (record for I., probably not the Rock). *Genista Hænseleri* (record for I., Kelaart did not record it). *Ononis campestris* (record for I., Talbot's records are worthless). *Asperula hirsuta*, and *Coleostephus Myconis* (records for I., Kelaart did not record them). *Andryala arenaria* (citation of Boissier for II., he records it "on the Rock"). *Nepeta reticulata* (certainly an error).

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A FLORA OF GIBRALTAR AND THE NEIGHBOURHOOD.

By Major A. H. WOLLEY-DOD.

Introduction.

During two visits to Gibraltar, from November to June inclusive, in 1911 to 1913, I was able to devote practically the whole of my time to the study of the botany of the Rock and the adjacent portion of Spain, which proves to be considerably richer than is indicated by the Floras hitherto published. That finality is not nearly reached is shown by the number of unrecorded species that may be found in any excursion to the less easily accessible localities and, indeed, even in those which have been most worked.

The limits covered are not very well defined, the ground searched being very irregular in outline; it may be roughly stated as including all the neighbourhood of Gibraltar, San Roque, and Algeciras, as far north as a line drawn from La Tunara on the Eastern Beach to Malaga Gardens, thence to the gap between the Sierra Lorca and Alcadeza Crags, and on to the Almoraima Convent. The country between the Guadarranque and Palmones Rivers has been almost unexplored by me, except the strip between the railway and the sea. South of the Palmones River I have explored the Waterfall Valley and some of the adjacent valleys and slopes, as well as much of the ground about Algeciras, chiefly to the north, with two excursions to Carnero Point. In general, the region covered by my Flora may be regarded as that which can be reached from Gibraltar or Algeciras in a day's walk, assisted in one direction by the railway; but by making fuller use of the railway than I did, a considerably greater area of country about and beyond Jimena might be embraced. Much of this ground has been worked by former botanists, but, to judge from the records, it appears that little attention has been given to the Alcadeza and Cork Wood Crags, or to the less accessible parts of the woods themselves; also to the marshes between the rivers, and to the shore and hills about Carnero Point.

Geology and Topography.

The region covered by the Flora lies between 39° 5′ and 36° 15′ N. latitude, and 5° 20′ to 5° 30′ W. longitude, and is for the most part hilly. The lower rock formation of the Spanish portion is Jurassic limestone, with an overlying compact yellowish sandstone forming the Algeciras Mountains, which rise to 2500 ft.

or more, the Queen of Spain's Chair, or Sierra Carbonera, 978 ft., and the Sierra Lorca and Alcadeza Crags, of lower elevation. The surface soil is very largely a compact stony gravel, with considerable beds of stiff clay, but it becomes sandy in many places, and there are large stretches of sand near the coast. The surface, especially on the hills, is intersected by numerous watercourses, but excepting the Rivers Guadarranque and Palmones and some of the streams from the Algeciras Mountains, they only run during the rainy season, and in very dry years even the larger streams dry up. An extensive marsh, partly saline, exists at Palmones and Guadacorte, and perennial wells are numerous in the sandy ground cultivated for vegetables near Linea and Palmones.

Spain is connected with Gibraltar by a belt of sand about two miles wide, extending from Gibraltar Bay to the Mediterranean. The town of Linea lies across this, separating the Spanish portion of the sand from the Neutral Ground. In the former region the sand is undulating and very bare of vegetation, except where it is irrigated for cultivation, but the Neutral Ground is flat, hardly rising 10 ft. above the sea, and is far more fertile.

The Rock itself is of secondary limestone, rising vertically to a height of 1350 ft. from the North Front (the highest point being 1439 ft., about $1\frac{1}{4}$ mile further south), and sloping steeply on its western face, at the foot of which lies the town. The limestone is full of hollows and pot-holes, and several extensive caves exist; the hollows are filled with a fertile soil, but from the nature of the rock they very soon get dry. There are no permanent watercourses, nor even temporary ones, except during the actual fall of heavy rain, and there are no marshes. Here and there on the lower portions, as about the Alameda and Windmill Hill, a reddish sand appears, and on the eastern side, which in its upper portion is precipitous, lies a steep slope of blown sea sand, which supports a scanty but characteristic vegetation.

Climate.

The mean maximum temperature in July and August, the hottest months of the year, is 84°, the mean minimum then being 75°, while maxima over 90° are not infrequent.* In January and February, the coldest months, the means are 63° and 55° respectively. Frost very rarely occurs, and only on the higher or more exposed parts, though records exist of ice an inch thick on shallow pools, which, however, soon disappears in the sun.

The annual rainfall averages 28·5 in., but varies from 15 in. to 60 in. or even more. Of this the bulk falls between November and April, the months of June to August rarely receiving a total of 1 in. Kelaart records twenty-five consecutive years when no rain fell in July. The effect of this climate is that, botanically speaking, spring begins in November, the most floriferous months being March to May, after which all the annuals are dried up; in

* The mean minima seem too high, but I have not been able to check them by official records.

July to October comparatively few species have their normal flowering period, though quite a considerable number linger on till November. But the number of succulent and really heat-resisting species is few, and in the summer the whole country assumes an arid and burnt-up aspect, and with few exceptions, flowering plants must then be sought in shady spots and water-courses.

Historical Sketch of the Botany.

When I undertook this work, I had no intention of doing more than cataloguing the species already enumerated in the local Floras, with the addition of those found by myself; but since the body of the book went to press, I found more leisure for studying the records of the earlier botanists, and have been struck by the number of species recorded by them which have been disregarded by later writers, and consequently not embodied by me. At the same time it must be borne in mind that few botanists have drawn any hard and fast line between the flora of the Rock proper and that of the surrounding country, and the difficulty of assigning to the North Front its proper records is increased by the ambiguous references to the Neutral Ground. It is also clear that modern writers have incorrectly referred many species to the Rock which were never collected there, nor were even stated by their recorders to have been found there. This is especially the case with Colmeiro, who assigns nearly all Kelaart's records for the neighbourhood, as well as many of those of the older collectors, to "Gibraltar," including the very untrustworthy and unintelligible ones of Talbot (*i.e.* James), which are dealt with later. Hence I am unable to make use of the citations of this author, which contain other obvious errors.

The Rock.

The following is a list of the principal collectors and their records for the Rock, compiled from their own writings and from such of the citations of Willkomm and Lange, Kelaart, Debeaux and Perez Lara as appear likely to be correct. A few records are assigned to Lamarck, Cavanilles, Jussieu, and others, even to Linnæus: I do not think any of these ever visited the Rock, but cite specimens they have seen.

I have given the lists as I find them, merely substituting, where possible, modern for ancient nomenclature, though in doing so there may be danger of misinterpreting synonymy. I have not, however, repeated in later lists species recorded in earlier ones, except in cases where they tend to confirm otherwise doubtful records. It will be apparent that many mistakes in naming have been made, or that many species have disappeared from the Rock. I strongly incline to the former view, and have consequently made many exclusions, shown by square brackets. Some of these are of plants known to be found only on the Neutral Ground, which would doubtless have been recorded as "Gibraltar." A few of the records serve to corroborate species I had already excluded, while others, shown in round brackets,

are still doubtful, and where mentioned in the Flora are there marked "?" These corroborated species, if recorded by two collectors, and a few which otherwise appear to be probably correct, have been accepted, but the number excluded, although definitely stated to have been gathered on the Rock, is still large.

Charles de L'Ecluse, or Clusius, in Rar. Stirp. Hisp. Obs. Hist. (1576) and Rar. Plant. Hist. (1601), cites the following species for Calpe: there is another Calpe near Hifac in Valentia, but with the exception perhaps of *Crucianella maritima*, all the records here given appear to be for Gibraltar; they were collected about 1565:—

Cytisus triflorus, *Crucianella maritima*? *Diotis maritima*, *Lavandula dentata*, *Teucrium fruticans*, *Romulea Clusiana*, *Narcissus niveus*. The last species is given by Clusius as *N. totus albus alter*, i. e. *N. polyanthus*, but Kelaart supposes, no doubt rightly, that *N. niveus* is meant.

Pitton de Tournefort (1676–90) collected in Spain. A MS. catalogue of his species is among the Banksian MSS. in the National Herbarium; this contains a list of seventy-five species gathered on the Rock, chiefly between the summit and Europa, three of which had already been recorded by Clusius. The list is in pre-Linnean nomenclature, and only the following are easily identifiable. The list is headed "*In Monte Calpe, præsertim eundo ad virginem Europæ, tum in vertice*," which seems incontrovertibly definite, yet there are eleven species which I am compelled to exclude as unconfirmed or improbable, and those from only two-thirds of the list, which is all I can interpret:—

Clematis cirrhosa, [*Helleborus fœtidus*], *Lobularia maritima*, *Ruta chalepensis*, *Pistacia Terebinthus*, *Anagyris fœtida*, *Spartium junceum*, *S. spinosum* (probably *Calycotome villosa*), [*Cytisus hirsutus*] (Willk. Prodr. iii. p. 454, thinks *Argyrolobium argenteum* is meant), *C. linifolius*, [*Anthyllis Barba-Jovis*], [*Biserrula pelecinus*], *Myrtus communis*, [*Medicago circinnata*], *Petroselinum peregrinum*, *Bupleurum fruticosum*, *Crithmum maritimum*, *Thapsia garganica*, *Ferula tingitana*, *Smyrnium Olusatrum*, *Fedia graciliflora*, *Asteriscus maritimus*, *Kentrophyllum arborescens*, [*Carthamus corymbosus*], [*Stœhelina dubia*], [*S. arborescens*], [*Arbutus Unedo*], *Cerinthe major*, *Vinca major*, [*V. minor*] (probably both were *V. media*), *Scrophularia sambucifolia*, *S. frutescens*, *Chœnarrhinum villosum*, *Lavandula Stœchas*, *L. multifida*, *Calamintha menthæfolia*, *Phlomis fruticosa*, *Thymus hirtus*, *Acanthus mollis*, [*Laurus nobilis*], (*Osyris alba*), *Aristolochia bœtica*, *Theligonum Cynocrambe*, *Arisarum vulgare*, *Iris Sisyrinchium*, *Asparagus albus*, *Asphodelus fistulosus*, *A. microcarpus*.

Lieut.-Col. T. James, Royal Artillery, in his *History of the Herculean Straits*, p. 338 (1771), gives a list of English names of about three hundred species which grow or are cultivated on the Rock, stating whether they grow on the front, back, top, or in gardens. It is not always easy to identify these, many of the names having been applied to more than one species. Colmeiro

gives what he supposed to be their Latin equivalents, and attributes them to Talbot, *i. e.* Sir J. Talbot Dillon, who, without acknowledgement, copied James's list into his *Travels through Spain* (1780). It does not appear that Dillon ever went to Gibraltar. Though many of the species are undoubtedly natives of the Rock, their doubtful associations and the difficulty of ascertaining precisely what James's names meant, render the whole list untrustworthy, and I do not propose to establish any records upon it. It is too long to reproduce here, but forms an interesting study.

L. Née collected in Andalusia in 1780–82. I am not sure that he ever visited the Rock, but the following records are assigned to him for Gibraltar:—

Delphinium pentagynum, *Lotus cytisoides*, (*Thapsia decussata*), *Notochlæna vellea*.

Ayala's *History of Gibraltar* (1782) gives about thirty names in popular Spanish nomenclature, some cultivated and others mentioned only by the generic name. The following are the only ones at all definitely indicated:—

Myrtus communis, *Umbilicus pendulinus*, *Hedera Helix*, *Convolvulus Soldanella*, [*Cynanchum monspeliacum*], *Rosmarinus officinalis*, *Euphorbia dendroides* (probably *E. Characias*), *E. Paralias*, [*E. Myrtites* (sic)], *Scilla hemisphærica*, *Allium roseum* (ex Colm.).

Francis Masson collected in Gibraltar, Spain, and Portugal in 1783. A MS. list of his specimens in the Banksian herbarium is in the National Herbarium. The following are marked "Gibraltar," omitting two already recorded. The number of exclusions is disconcertingly large, and may be partly due, as with Tournefort's list, to a misinterpretation of some of the names, or to errors on Masson's part. It is more than likely also that his "Gibraltar" meant the whole neighbourhood:—

Delphinium peregrinum, *Papaver hybridum*, *Cistus albidus*, [*C. anglicus*], [*Halimium Libanotis*], *Reseda alba*, [*Eudyanthe læta*], *Silene littorea*! (recorded as *Saponaria ocymoides*), *Cerastium gibraltaricum*, *Ruta graveolens* (doubtless *R. chalepensis*), *Cratægus Oxyacantha* (i. e. *C. monogyna*), [*Chærophyllum*, sp.], *Torilis nodosa*, *Orlaya maritima*, *Elæoselinum fœtidum*! [*Pterocephalus Broussonetii*], *Campanula mollis*, *C. Rapunculus*, *Thymus diffusus*! [*Satureia Juliana*], [*Sideritis hyssopifolia*] (Willk. Prodr. ii. p. 454, thinks this may be a form of *S. scordioides*), [*S. montana*], *Anagallis linifolia*, [*Armeria latifolia*], (*Statice cordata*) (perhaps *S. virgata*), *Plantago Lagopus*, [*Panicum junceum*], *Spartina stricta*, *Agrostis panicea* (probably *Polypogon monspeliensis*), *Lagurus ovatus*, *Corynephorus canescens*, *Cutandia maritima*, *Melica ciliata*! *Dactylis glomerata*, *Vulpia geniculata*! *V. Alopecurus*! *Agropyron junceum*, *Brachypodium distachyum*, *Lobium perenne*.

The Abbé Pourret collected in Spain about 1790. The following are among his records for "Gibraltar," but perhaps not for the Rock itself:—

Erucastrum incanum, *Rapistrum rugosum*, *Polygala rupestris*, *Linum maritimum*, *L. strictum*, *Medicago hispida*, (*Daucus crinitus*), [*Hippomarathrum pterochlænum*], *Centranthus macrosiphon*, [*Datura Metel*], *Euphorbia Chamæsyce*, *Asplenium Trichomanes*.

P. M. A. Broussonet collected in South Spain from about 1793. Some of his specimens are dated 1821. The following are among his records from "Gibraltar"; the list would be more than doubled if all the species attributed to him by Colmeiro were included, which doubtless came from the neighbourhood. I have only included the grasses from Colmeiro:—

Fumaria capreolata, *Glaucium luteum*, *Matthiola tricuspidata*, *Biscutella apula*, (*Erodium Jacquinianum*), *Ononis variegata*, *Lotus edulis*, *L. ornithopodioides*, (*Ornithopus sativus*), *Scorpiurus sulcata*, [*Pimpinella villosa*], *Kundmannia sicula*, *Vaillantia muralis*, *Scabiosa stellata*, *Helichrysum rupestre*, (*Tragopogon porrifolius*), (*Campanula patula*) (specimen probably *C. Loeflingii*!), (*Linaria cirrhosa*!), (*L. triphylla*!), *L. tristis*, (*Lafuentea rotundifolia*), *Sideritis arborescens*, *Teucrium bœticum*, (*Thymelæa canescens*), [*Euphorbia Peplis*], [*E. exigua*], *Macrochloa tenacissima*, *Piptatherum miliaceum*, *Kœleria phleoides*, *Melica minuta*, *Serrafalcus hordeaceus*, *Bromus madritensis*!, *Lepturus incurvatus*.

The Abbé P. Durand collected between 1798 and 1807. I only trace the following records for Gibraltar:—

Delphinium Staphisagria, *Galium murale*, *Stachys circinnata*.

From Herb. Pavon, at Madrid, collected about 1800, the following species are cited, but no collector's name is given:—

(*Galium divaricatum*), *Euphorbia rupicola*.

To F. Haenseler (1761–1847), who collected about 1800, are credited:—

Retama monosperma, *Lotus arenarius*, *Alternanthera Achyrantha*.

S. de Rojas Clemente worked in Andalusia in 1802–4. His records, besides several already noted, and a considerable number attributed to him by Colmeiro, doubtless from the neighbourhood, are these:—

Bupleurum gibraltaricum, (*Nepeta reticulata*), (*Agrostis interrupta*), *Gymnogramma leptophylla*, *Scolopendrium Hemionitis*.

Sir Thomas Gage (1781–1820) collected about 1805, probably on the Rock. I have seen the following specimens (ex herb. Gouan):—

Campanula dichotoma! (*Linaria cirrhosa*)! *Anagallis linifolia*!

Von Spix and Von Martius, in *Travels in Brazil*, vol. i. p. 54, give a long list of plants seen by them in the neighbourhood of Gibraltar, where they arrived in May, 1817. At the end the following are mentioned as specially characteristic of the flora of the Rock itself. These lists have been overlooked by all later writers except Kelaart, who, however, makes only partial and incorrect use of that for the Rock:—

Cytisus candicans, *Vinca major* (doubtless *V. media* is meant), *Verbascum sinuatum*, [*Anarrhinum tenellum*] (Willk., Prodr. ii. p. 581, thinks *Linaria spuria* may be meant, but that is a very different species, also unrecorded; *Chænarrhinum villosum* is much more probable), [*Thymus patavinus*], *Phlomis purpurea*, *Sideritis subspinosa* (doubtless *S. scordioides*), *Prasium majus*, *Statice spathulata*, *S. sinuata*, *Daphne Gnidium*, *Chamærops humilis*. Kelaart wrongly interprets *Anarrhinum tenellum* as *A. bellidifolium*, and credits Von Martius's Rock list with *Lythrum Hyssopifolia*, [*Cachrys Pterochlæna*], [*Euphorbia Esula*], and [*E. segetalis*], which he only records from the neighbourhood.

C. Gaudichaud, in the Botany volume of the Voy. aut. du Monde, by L. Freycinet, gives a list of plants collected by himself in Gibraltar in 1817, which are now in herb. Delessert. He was only there for a very short time, and it is fairly certain that he only collected on the Rock. Many of the exclusions are recognisable as probable errors. This list has been unnoticed by all subsequent authors:—

Ranunculus bullatus, *Iberis gibraltarica*, [*Alyssum incanum*], *Silene inflata*, "with purple flowers," *Malva* spp., *Erodium Cicutarium*, *E. malacoides*, *Ruta graveolens* (probably *R. chalepensis*), *Lotus corniculatus*, [*Rubus saxatilis*, "espèce couchée, très petite, aux fol. lanceolées"], "un Crassule exotique aux feuilles ovales et arrondies au sommet" (probably *Sempervivum arboreum*), *Saxifraga* spp. (*S. globulifera*), *Mesembryanthemum* spp., *Scabiosa* spp., [*Erigeron canadensis*], *Calendula incana*, *C. tomentosa*, *C. suffruticosa*, [*Senecio erucifolius*], *S. vulgaris*, *Carduus* spp., [*Centaurea Jacea* v. *nigra*], *C. Calcitrapa*, [*Hypochæris radicata*], *Lactuca perennis* (probably *L. tenerrima*), *Olea europæa*, *Convolvulus althæoides*, *Borago officinalis*, *Echium creticum*, *Cynoglossum officinale* (probably *C. cheirifolium*), *C. pictum*, [*Verbascum Osbeckii*], *Antirrhinum majus*, *Thymus vulgaris*, *T. creticus*, *Coridothymus capitatus*, [*Salvia officinalis*], [*S. hispanica*], *S. horminum* (=*S. verbenaca*), *Phlomis fruticosa*, *Salsola Soda*, *Suæda fruticosa*, [*Rumex Acetosa*], [*R. Acetosella*], *R. bucephalophorus*, *Daphne* [*Laureola*] vel *Gnidium*, *Aristolochia Pistolochia* (perhaps *A. bætica*), *Ricinus communis*, *Parietaria lusitanica*, *Arum italicum*, *Chamærops humilis*, *Neottia spiralis* (doubtless *Spiranthes autumnalis*), *Asphodelus albus*, *Cyperus rotundus*, *Ceterach officinarum*, *Polypodium vulgare*.

H. W. Schott, who arrived in Gibraltar in October, 1817, has a list in *Isis*, 1818, p. 818, of plants he collected on the Rock, which, excluding previous records, is as follows. His herbarium is at Prague, and probably contains further records which have been cited by later writers:—

Rubus ulmifolius (sp. nov.), *Eryngium maritimum*, [*Galium gibraltaricum* (sp. nov.)], *Lactuca tenerrima*, [*Andryala nigricans*], *Echium plantagineum*, *Panicum repens*, *Andropogon distachyum*. Willkomm also credits him with (*Juniperus Oxycedrus*), *Serapias cordigera*, (*S. Lingua*), (*Orchis longicruris*), and *Ophrys*

aranifera; but these are not in Schott's list, and may have been mis-cited for the Rock instead of from the neighbourhood.

P. SALZMANN collected in Spain in 1823. A considerable number of citations from his collections exists, many of them as "Gibraltar," but only four out of the following five not previously recorded are established for the Rock, *Spergularia fimbriata* having been more probably found on the Neutral Ground :—

(*Spergularia fimbriata*), *Ononis diffusa*, *Orobanche sanguinea*, *Piptatherum cærulescens*, *Scleropoa loliacea*.

PHILIP BARKER WEBB visited Gibraltar in 1827, and published about a dozen names in his *Iter Hispanicum* in 1838. A few other species are also referred to him, but only the following are new :—

Frankenia lævis, *Silene mollissima*, [*Pterospartum lasianthum*], *Lathyrus Clymenum*, *Vicia gracilis*, *Cyperus badius*.

RAMBUR worked at about the same time as Webb, but has few new records. Those which have been credited to the Rock are as follows :—

Oxalis cernua, *Sarothamus bæticus*, (*S. grandiflorus*).

Dr. K. FINDLAY collected in the neighbourhood about 1835. I have seen the following specimens of his labelled Gibraltar, but it is not stated that they were found on the Rock :—

(*Lathyrus angulatus*!), (*Centaurea polyacantha*!), *Anagallis linifolia*! (already recorded), (*Armeria macrophylla*!).

E. BOISSIER, in Voy. Bot. dans le Midi de l'Esp. (1837), gives seventy-seven species of his own collecting on the Rock. The following, which include a few cited elsewhere, have not been previously recorded. Those excluded belong to the Neutral Ground :—

Fumaria parviflora, *Malcolmia littorea*, *Succowia balearica*, *Brassica papillaris*, *Silene colorata*, *S. gibraltarica*, *Lavatera trimestris*, *Cytisus linifolius*, *Ononis reclinata*, *O. gibraltarica*, *Caucalis leptophylla*, *Daucus gingidium* (= *D. gummifer*), [*Cachrys Pterochlæna*], [*Pycnocomon rutæfolium*], *Centaurea sphærocephala*, *Hedypnois arenaria*, *Thrincia hispida*, *Jasione montana*, *Solanum nigrum*, *Linaria pedunculata*, *L. amethystea*, *Nepeta tuberosa*, *Teucrium Polium*, *Achyranthes argentea*, *Rumex thyrsoides*, *R. tingitanus*, *Ruppia maritima*! (as *R. rostellata*), *Ruscus Hypophyllum*, *Gastridium lendigerum*, *Ammophila arundinacea*, *Trisetum neglectum*.

The following species are attributed to Boissier or to Boissier and Reuter by Willkomm and Lange and others, doubtless from herbarium specimens, as they are not recorded from the Rock by those authors. I have seen Boissier's specimen of *Helichrysum decumbens*. The stations cited on Boissier and Reuter's labels are in most general terms and often misleading :—

Fumaria macrosepala, *Linum setaceum*, *Chætonychia cymosa*, *Helichrysum decumbens*! *Picridium vulgare*, *Andryala integrifolia*, *A. arenaria*, *Adiantum Capillus-Veneris*.

M. Willkomm published in Bot. Zeit. 1845 an account of his travels in that year through the south of Spain, which was translated in Ann. Nat. Hist. xvii. pp. 115, &c. He gives (on pp. 737–743 and 753, *l. c.*) the following new records for the Rock :—

Ranunculus flabellatus, Geranium rotundifolium, G. Robertianum, Erodium moschatum, E. laciniatum, Ruta bracteosa, Pistachia Lentiscus, Physanthyllis tetraphylla, Psoralea bituminosa, Hippocrepis multisiliquosa, Ecbalion Elaterium, Asteriscus spinosus, Pinardia coronaria, Phagnalon saxatile, Senecio minutus, Galactites tomentosa, Centaurea pullata, Picridium tingitanum, Ætheorrhiza bulbosa, Convolvulus siculus, Solanum villosum, S. Sodomæum, [Chænarrhinum origanifolium], (? C. villosum), Veronica Cymbalaria, Emex spinosus, Osyris lanceolata, Mercurialis annua, Euphorbia helioscopia, Urtica membranacea, Ophrys lutea, Ornithogalum umbellatum, Smilax mauretanica.

Willkomm gives a few further records in Prodr. Fl. Hisp., which was not published till 1870, and others are attributed to him by later writers, and though there is no doubt these were collected in 1845, I am not sure that they all came from the Rock. His earlier labels often leave it doubtful whether the specimens were gathered on the Rock or not. His records in the *Prodromus* would be more numerous but for the fact that he passes by many with the remark that they are common in South Spain :—

(*Malcolmia lacera*), *Fumana glutinosa*, [*Erodium Botrys*, the specimen is *E. laciniatum*!], *Retama monosperma, Vicia hybrida, Scandix Pecten-Veneris, Vaillantia hispida, Senecio foliosus, S. lividus, Sonchus tenerrimus, Andryala arenaria, Echium calycinum, Stachys hirta, Plantago Psyllium.*

Dr. C. M. Lemann collected at Gibraltar in 1840–1. Most of his records were communicated to Kelaart, but two or three are cited by others, and I have seen specimens at Kew of those indicated. Those not previously recorded are :—

Ranunculus blepharicarpus, Hesperis laciniata, Biscutella lævigata, Alsine tenuifolia, Spergula arvensis, Linum angustifolium, Lavatera cretica, Rhamnus Alaternus, Trifolium subterraneum, [Astragalus depressus], Ornithopus compressus, Lathyrus setifolius! Thapsia villosa, Ferula communis (probably *F. tingitana*), *Valerianella discoidea, Hyoseris scabra, Echium Pomponium,* (*Linaria viscosa*!), [*Orobanche reticulata*], *Micromeria græca, Thesium humile, Euphorbia serrata*!, *Ephedra fragilis, Orchis cordata, Fritillaria lusitanica, Uropetalum serotinum, Muscari comosum, Equisetum ramosum, Asplenium Adiantum-nigrum.*

Dr. E. F. Kelaart, in 1843–5, enumerated 174 native or naturalized species not previously noted. The list is too long to reproduce. The number does not include any doubtful records or cultivated species.

H. A. Hurst collected in the neighbourhood in 1848. He was careful to label plants not collected on the Rock "near Gibraltar,"

so I think the following, labelled "Gibraltar," may be relied upon:—

Delphinium Staphisagria!, *Atractylis cancellata*!, and *Chlora perfoliata*!

John Ball collected in the neighbourhood in 1851, and again in 1871. I can only trace the following, probably for the Rock:—

Sisymbrium Irio and *Antirrhinum tortuosum*.

E. Dautez collected from 1872 to 1880, chiefly in the San Roque district, but he has the following records from the Rock. His collections were all determined by M. Debeaux:—

Fumaria agraria, *Diplotaxis erucoides*, *Raphanus Raphanistrum*, *Lepidium Draba*, *Senebiera Coronopus*, *Tuberaria inconspicua*, *Dianthus Caryophyllus*, *Saponaria officinalis*, *Sagina maritima*, (*Erodium Salzmanni*), *Melilotus parviflora*, *Trifolium suffocatum*, *Astragalus hamosus*, *Coronilla glauca*, *Lathyrus Ochrus*, *Œnothera stricta*, *Fedia Langei*, *Conyza ambigua*, *Gnaphalium luteo-album*, (*Senecio leucanthemifolius*), *Hedypnois tubæformis*, *Picridium intermedium*, *Sonchus asper*, (*Andryala laxiflora*), *Cuscuta Epithymum*, (*Lithospermum fruticosum*), *Salvia triloba*, *Lamium amplexicaule*, *Stachys lusitanica*, *Amaranthus deflexus*, *Rumex crispus*, *Parietaria mauretanica*, *Celtis australis*, *Ophrys Speculum*, *Allium paniculatum*, *Setaria verticillata*, *Cynodon Dactylon*, *Scleropoa rigida*, *Lamarckia aurea*, (*Bromus tectorum*), *Hordeum maritimum*.

G. Maw collected *Crocus Salzmanni* on Windmill Hill in 1883.

M. A. de Coincy gathered *Lemma gibba* in or near the Inundation in 1887. He also described in Journ. de Bot. xiii. p. 162 (1899) *Trifolium carteiense* from near San Roque. I have not seen specimens, but it seems to be near *T. lappaceum*.

E. Reverchon collected on the Rock in 1887, but though his new records for Algeciras are considerable, he found nothing new on the Rock.

A few records each have been assigned to the following, with their approximate dates, but the usual doubt exists as to the exact habitats, and I have only admitted them with doubt:—Funk (1848), Laguna (1860), Amo (1860–61), Fritze and Winkler (1873), Bilimek (1877), Hegelmaier (1878), and Perez Lara (1876–80).

The present Flora shows about 101 new records of species, that is, those for which no definite former Rock records exist; but some of them, from their commonness, must have been known to Kelaart and Dautez, and their omission was probably due to an oversight, and about ten were already known on the Neutral Ground. There are in addition about half a dozen naturalized aliens, or casuals, recorded for the first time.

It would occupy too much space to give details of the records of plants found in the neighbourhood of Gibraltar. The botanists who have worked the region are practically the same as those who have explored the Rock, with a few additions.

Very few of the records of Von Martius and Schott have been

taken up by later writers on the botany of Spain, while many of those of Salzmann, Broussonet, and later collectors have been adopted. The justification for this is not apparent, unless it be that modern writers have included species from collectors which they have seen. I hesitate on my own responsibility to accept them all, especially as many of them are highly improbable, thus their whole lists are open to suspicion; but I have included the more probable ones in the list of species to be searched for which is given at the end of this preface.

Clusius worked a great deal in Spain, but his localities are not precisely defined, so there are no additional records to those on the Rock. Tournefort also published no list for the surrounding country. Schousboe (1798–9) first found *Linaria Munbyana*, *Salvia bullata*, and *Narcissus viridiflorus*, while Gaudichaud, who gives such an interesting list of Rock plants, did not visit the country round.

Lists of plants collected by the following exist:—

A MS. list of Masson's plants in the National Herbarium names seventeen species for San Roque, of which *Satureia Juliana* is unconfirmed by later authors.

Von Martius's list contains 192 species, at least twenty-five of which are improbable or wanting in confirmation. This large number may be due to incorrect diagnoses, or to the somewhat loose application of the older names, the synonymy of which is often doubtful. Others which are confirmatory of records I had excluded, as well as some of the more likely ones, are taken up in the Appendix to this work.

Schott's list, which he heads "plants collected," contains names of species only known for the Rock, as well as some only known for the neighbourhood, so there is some doubt as to which they should be referred to. It contains 150 species, with about the same number of doubtful records as that of Von Martius, to which the same remarks apply.

Salzmann only names five species, of which only *Ononis hispida*, for which he may have mistaken *O. Cossoniana*, is unrecorded elsewhere.

Willkomm and Boissier published lists of some of the plants they saw in their travels in the works already referred to. These are all taken up in the present Flora.

Kelaart's list in *Flora Calpensis* contains, as already explained, species which occur beyond our limits; those which are unconfirmed for our region are shown in the Appendix to this work.

Dasoi, who collected in 1887, submitted his plants to Gandoger for determination. The result is the inclusion of many improbable names. Moreover, there is no knowledge of the extent of country explored by him, so that his list has no value. It was published in Bull. Soc. Bot. Fr. xxxiv. pp. 223 and 309, and some account of it will be found at the end of Debeaux's Flora.

A much more trustworthy list of Reverchon's finds, mostly about Algeciras in 1887, is published by Rouy in the same volume (p. 434). Fritze, Winkler, Nilsson and Hackel also found

many interesting species at about the same time, but I have seen no separate publication of their discoveries.

Dautez, between 1872 and 1880, did an immense amount of good work chiefly in the San Roque district. His plants, many of which have been found by no other botanist, were determined by Debeaux.

Of other collectors not previously named, mention may be made of Gutiérrez, La Gasca, Alioth, de Noe, Kusisnky, and Porta and Rigo, the two last-named finding some half-dozen North African species not hitherto found in Europe.

Literature.

Three works have been devoted to the botany of Gibraltar and its neighbourhood, and one to that of the whole province of Cadiz.

The *Flora Calpensis*, by Dr. E. G. Kelaart, M.D. (1818 ?–1860), of the Army Medical Staff, published in 1846, was for many years the only book on the subject. He enumerates 512 species for the Rock; this number includes about a dozen species mentioned in the notes in parts II. and III., which have been confirmed by other authorities. Several other species so mentioned have not been included. He also enumerates 229 additional species for the neighbourhood, *i. e.* within twenty miles of Gibraltar. His Gibraltar list must, however, be largely discounted by the exclusion of many cultivated species, obvious errors or at least very doubtful records, and naturalized aliens, as well as of plants recorded as species but now reduced to varieties. His nomenclature is sometimes difficult to follow, and there is usually much doubt as to which species were found by him on the North Front, and which on the Neutral Ground, which I have treated as a separate district, and which is really a part of Spain rather than of Gibraltar. Kelaart uses the name Neutral Ground to cover both areas, and though, doubtless, many of the species now found only on the real Neutral Ground were in his day also found on the North Front, there is no certainty; hence some of my exclusions from the restricted Flora of Gibraltar or Rock (District I.) may appear arbitrary. The exclusions from Kelaart's list under these various headings are:—

Cultivated or casual species, and those now reduced to varieties	53
Naturalized aliens	9
Probable errors (some excluded, some only marked with doubt in this Flora) . .	42
Confined to Neutral Ground	12

Leaving 396 species native on the Rock, having the same status as those admitted into the present Flora.

In my citations from Kelaart's book I have made use of the details given in Part II. of the work, which amplify or modify those given in Part III.

After an interval of forty years, Don J. M. Perez Lara began in 1886 the publication of his *Florula Gaditana*—the whole

province of Cadiz—in Anales Soc. Hist. Nat. Espan. His work runs interruptedly through vols. xv.—xxvii. (1898), and was completed in 1903 by an appendix published in the Mem. Soc. Esp. Hist. Nat., vol. ii. He does not include many of the previous records, but the later ones of Reverchon, Winkler, Dautez, and other collectors, are all noted. The *Florula* contains useful notes on some of the species, though their utility would have been enhanced had more attention been given to the differentiation of allied species and varieties than to a mere statement of their range of variation, which is confusing rather than elucidatory.

Gibraltar being geographicallly considered as part of Spain, no special effort has been made to segregate its records, consequently several for the neighbouring country have been credited to the Rock itself, and sometimes the reverse mistake has been made. This is doubtless due to the comprehensive use of the name "Gibraltar" by most collectors, and the ambiguity of the name "Neutral Ground," though not actually used by Perez Lara, also has led to confusion.

Perez Lara's work was a great advance on Kelaart's, and surpasses in utility and number of local records that of Debeaux, though the latter was specially devoted to the flora of Gibraltar and its neighbourhood. The total records for the whole province are 1905 species, and after making due allowance for excluded species, doubtful records, naturalized aliens, and those reduced to varieties, there are the following records for our region :—

For the whole region . .	951
For Gibraltar only . .	462

These totals are doubtless larger than they should be, because I have included all species known for our region which Perez Lara specifies as common in the whole province, without giving any detailed stations. Some of these are certainly rare with us, a few are not recorded, and quite a number are not known for the Rock; these last I have, of course, not included in the totals. It is highly probable that no station within our limits was known to Perez Lara for many of the others, but I have been unable to discriminate, so had no alternative but to include all that I knew to exist with us.

A *Synopsis de la Flore de Gibraltar* was published by O. Debeaux in 1888 in Actes Soc. Lin. Bordeaux, vol. xlvii. The author was but slightly acquainted with the region, and appears to have done little or no collecting there himself, relying mainly on notes and specimens submitted to him by Dautez: consequently he gives quite a false impression of the relative frequency of the species, as well as sometimes wrongly assuming a variety only to exist, whereas the type is far the commoner. His prefatory remarks also lose much of their value from the obscurity of his topography; thus, he confuses St. George's Hall, on the northern precipice, with St. George's Tower, near the southern end, better known as O'Hara's Tower but now demolished. I have not, therefore, availed myself of the special localities given in that

part of his book. In some cases, also, localities are incorrectly cited, but usually this is due to the comprehensive nature of those on collectors' labels referred to above. There are many omissions of localities recorded by Kelaart for the Rock; though he cites the page in Kelaart's Flora in which the records occur. On the other hand, he credits that author with many localities not mentioned in his work, apparently assuming that Dautez's and Kelaart's stations were identical. Many of my records for District I. have been due to acceptance of Debeaux's citations which further research has proved to be false, necessitating many corrections in my Appendix. Reverchon's finds are often only mentioned in observations interspersed in the text, and it is not clear why these and others are not included in the numbered series. Debeaux enumerates 965 species, and an additional 72 in his observations, making 1037 for the whole region, of which only 367 accepted species are mentioned for the Rock, 29 less than Kelaart enumerates, after making similar deductions for exclusions, &c.

In 1910, Mr. B. H. T. Frere published his *Guide to the Flora of Gibraltar*, which is almost entirely a compilation of previously published records, with the descriptions of all non-British species added. Unfortunately the author had overlooked the publication of Perez Lara's *Florula*, so a large number of available records are omitted, and the few that are added are mostly for species which occur far beyond our limits. The descriptions are not very clearly drawn up, since in attempting to make the work popular the author has made a compromise between technical and popular language, acceptable neither to botanists nor to those with no botanical knowledge. The omission of the descriptions of British species necessitates constant reference to other works which are not always readily obtainable on the spot. There is no attempt to emphasize the differences between allied species, and scarcely any varieties are given. The stations are very vaguely cited, no personal verifications are given, and there are no authorities for the nomenclature. As the work contains very little that is new, and omits *Juncaceæ* and all later orders, I have not attempted to tabulate the species recorded.

The Botanical Districts.

I have divided the region into three main districts:—I. Gibraltar, *i. e.* the Rock and the North Front as far as the British Lines. II. The Neutral Ground, kept as a distinct district for reasons explained below. III. Spain, which I have subdivided into—i. the San Roque subdistrict, from the Mediterranean to the Guadarranque River, as far north as the limits of the region; ii. the Algeciras subdistrict, or all that portion of the region lying south of the Palmones River; and iii. the Palmones subdistrict, between the rivers.

District I., Gibraltar, is of special interest, being wholly British territory. It consists of the Rock proper, with that part of the isthmus joining it to the mainland called the North Front.

The latter is sandy, and is now levelled and turfed for recreation where it is not occupied by buildings; only a small portion near the Devil's Tower and the rifle butts is in anything like its original state. Formerly the North Front was for the most part as wild and rough as the present Neutral Ground, and produced many species now "improved" out of existence, though some doubtless survived until Kelaart's time. These will be dealt with more fully under District II.

The Rock itself is a mass of limestone, sloping towards the west, with the bare rock appearing all over the middle and upper slopes. The backbone of the Rock, which is about two miles long, rises vertically from the North Front to an altitude of 1350 ft. into a sharp ridge from 1000 ft. to 1440 ft. high, extending to O'Hara's Tower, whence it falls steeply to the plateau of Windmill Hill, some 250 ft. above the sea and thence precipitously to Europa Flats at about 100 ft. The shore, except at the North Front and Catalan Bay, and a few points on the western side, is precipitous or artificial, consequently but few maritime plants are found, these being chiefly at Europa Point and Catalan Bay. The slopes are covered with much shrubby vegetation, often difficult to penetrate, and in recent years a considerable number of pine and other trees have been planted on the western slopes. The Alameda Gardens and the slopes towards Rosia were formerly much wilder, and parts of them were cultivated for vines and cereals. In this neighbourhood doubtless several of the species which are now extinct were to be found. On the east side a steep slope of sand gives a foothold for several species which only occur there and on the Neutral Ground, but doubtless formerly also grew on the North Front. Modern improvements and water catchments are rapidly destroying this interesting habitat. *Brassica papillaris* has already disappeared from its only known station.

Gibraltar, which has 587 native species, has a markedly different flora from that of the neighbouring parts of Spain. This is due to its limestone formation, the absence of water or damp places, the rarity of sand dunes, and the almost total absence of agriculture. Thus *Ericaceæ* are totally absent, while many other genera and species, which are quite common in the neighbourhood, are absent, or at least very rare, on the Rock. There are at least 236 such species, without reckoning moisture-loving ones. Another cause, which, however, has tended to a reduction of the number of species rather than to their nature, is to be found in the alteration to the western slopes. Formerly these slopes were open to the browsing of goats, so that the shrubs were rarely allowed to rise to a greater height than three or four feet, allowing plenty of room between them for smaller plants, but now the planting of trees and the erection of an unclimable fence at a low elevation, have kept out the goats, so that the taller growths have been encouraged and crowded out much of the undergrowth. Gaudichaud remarks upon the *total* absence, in 1817, of all trees taller than *Chamærops humilis*, though this must have been an

exaggerated statement. Europa Flats and the south and south-east slopes have been less affected by this cause than those to the west and north-west. On the other hand, forty-eight species found on the Rock are absent from the adjacent territory, the following not being recorded from the Cadiz province, some of them (shown in roman type) not being known in Spain at all. No doubtful records or naturalized aliens are included in this and similar lists:—

Clematis cirrhosa v. Dautezi (endemic), *Hesperis laciniata*? *Brassica sabularia* v. papillaris (endemic), Iberis gibraltarica, *Helianthemum origanifolium*, *Dianthus Caryophyllus*, Silene gibraltarica, *Spergularia rupestris*, *Linum maritimum*, *Lavatera arborea*, *Medicago obscura*, *Melilotus infesta*, *Trifolium suffocatum*, *Sedum micranthum*? Saxifraga globulifera v. gibraltarica, Ferula tingitana? *Vaillantia muralis*, *Helichrysum rupestre* v. Boissieri (endemic), *Senecio minutus* v. *gibraltaricus*, *Calendula suffruticosa*, *Barkhausia fœtida*, *Campanula mollis* v. *microphylla*, Antirrhinum tortuosum, *Lafuentea rotundifolia*? *Lavandula dentata*? Thymus diffusus (endemic), Salvia triloba v. calpeana (endemic), Phlomis fruticosa, *Sideritis arborescens*, Achyranthes argentea, *Parietaria lusitanica*, Crocus Salzmanni? *Notochlæna vellea*.

Besides *Ericaceæ* the following are some of the more striking species which are absent from or rare on the Rock, but common in Spain:—*Cistaceæ* (almost all species, though *Helianthemum origanifolium* is found in Gibraltar alone), *Spergula arvensis*, *Erodium primulaceum*, *Ulex* (all species), *Trifolium Cherleri*, *Hedysarum coronarium*, *Œnanthe pimpinelloides*, *Ormenis mixta*, *Carlina racemosa*, *Lavandula Stœchas*, *Romulea ramiflora*.

District II. Neutral Ground.—This is a very small area, about two-thirds of a square mile, lying between the British and Spanish Lines, and reaching from sea to sea. I treat it as a separate district on account of the peculiarity of its situation. It is isolated from the mainland of Spain by the so-called Sand Desert, or extensive sand dunes lying to the north of Linea, and, not being British territory, it cannot be included in District I. From physical considerations, it might have been desirable to have treated the Neutral Ground and North Front together as a separate district, or as part of District III., but it seems best to make the British Lines the limit of Gibraltar. The chief difficulty that arises is from the doubt whether many of the old records refer to the North Front or the Neutral Ground; but this is of less importance in view of the fact already pointed out, that formerly there was no North Front, so that the flora of the Neutral Ground must have reached the foot of the Rock. Its surface, though approximately level, is sufficiently undulating to allow pools of water to stand throughout the rainy season, thus providing suitable soil for quite a number of marsh-loving species to grow, chiefly on the west side, which is for the most part grassy. Towards the east the soil becomes more and more sandy, till on the shore only a few species are found, such as *Matthiola tricuspidata*, *Silene nicæensis*, *Ononis variegata*, *Medicago marina*,

Eryngium maritimum, *Diotis maritima*, *Pancratium maritimum*, and a few grasses.

The flora on the west and part of the east side is rich and varied, a number of species being found which, though fairly frequent in Spain, do not grow in the Sand Desert, and in some cases are rare south of San Roque. Besides several short visits I devoted two days to making as complete a list as possible of all the species seen. The number, including old records, amounts to 231, including five naturalized aliens, but without reckoning doubtful species or records, and there is no doubt that this can be increased. For example, several which occur *either* on the North Front *or* the Neutral Ground have been reckoned in neither. Twelve species and varieties are confined in our region to this district, *viz.* Reseda propinqua, *Erodium laciniatum* v. *involucratum*, *Ononis Tournefortii*, *O. variegata* v. *erioclada*, *Medicago littoralis* v. *inermis*, *Anthyllis Vulneraria* (type), *Centaurea sonchifolia*, *Veronica anagalloides*, *Euphorbia terracina* v. *latifolia* and v. *retusa*, *Juncus pygmæus*, *Paspalum Digitaria*, but of these all but the *Medicago* and the two last are in need of modern confirmation. No fewer than sixty-five species and several varieties do not occur in District I., though many occur in Spain. The commoner species are:—*Ranunculus trilobus*, *R. muricatus*, *Diplotaxis siifolia*, *Ononis variegata* (var. *erioclada* is endemic), *Medicago littoralis*, *Trifolium resupinatum*, *Lotus arenarius*, *Paronychia argentea*, *Hippomarathrum pterochlænum*, *Bellis annua*, *Peridereæa fuscata*, *Xanthium macrocarpum*, *Echium plantagineum*, *Linaria pedunculata*, *Plantago Coronopus*, *Alisma ranunculoides*, *Romulea ramiflora*, *Pancratium maritimum*, *Juncus acutus*, *Polypogon monspeliensis*, *Vulpia Alopecurus*.

District III. Subdistrict i. San Roque.—This subdistrict, which has an area of about thirty-one square miles, is of a varied nature. The whole southern end, for a distance of a mile or more, with a narrow belt along the coast, is of deep sand. This is succeeded by the Carteian Hills, of a hard stony gravel, with pockets of clay in many places, and with an undulating surface. Towards the east the Queen of Spain's Chair (Sierra Carbonera), of sandstone, rises to a height of 978 ft. The north-western end merges into the Cork Woods, which are for the most part sandy, with several marshes about the watercourses, some of which are perennial. The north-eastern portion, from the edge of the Cork Woods, is of an ericetal type running into the rugged Alcadeza Crags and Sierra Lorca, which produce some interesting and rare species. Around San Roque the country was, not many years ago, in a more or less virgin state, but is now mostly cultivated, which has changed the nature of its flora, and has perhaps extinguished a few species, but some of the more interesting ones remain. The Guadarranque River is tidal and muddy for a short distance from its mouth, otherwise there are no saline marshes.

Though this subdistrict has perhaps been more searched than any part except the Algeciras Mountains, there is still much to be done, the north-eastern slopes of the Chair, and especially the

Cork Wood and Alcadeza Crags being parts where new records can readily be made. It contains about 1020 native species, of which over 140 do not occur for certain elsewhere in our region. The list is too long to detail, but the following, in addition to several varieties, do not occur elsewhere in the province, those in roman type not being recorded from Spain, while those marked ? may occur elsewhere in our region:—Ranunculus tripartitus, *R. sceleratus*, Anemone coronaria v. micrantha (endemic), *Nasturtium hispanicum*, *Brassica fruticulosa*? *Helianthemum glaucum*, *Dianthus lusitanicus*, *Silene mellifera*, *S. italica*, *S. commutata*, Linum decumbens, *Hypericum crispum*, Genista Winkleri (endemic), *G. Hænseleri*, *Ononis breviflora*, *O. Natrix*, *Hippocrepis unisiliquosa*, *Vicia cassubica*, *V. tenuifolia*, *Spiræa flabellata*, *Sedum amplexicaule*, *Valerianella carinata*, *Cephalaria syriaca*, *Eupatorium cannabinum*, Prolongoa pectinata (confined to Cadiz province), *Filago apiculata*? *Carlina lanata*, *Carduus nigrescens*? *Centaurea alba*, C. uliginosa, *C. Seridis*? Jasione rosularis (endemic), *Campanula dichotoma*, *Erythræa Barrelieri*, *Convolvulus undulatus*, Orobanche mauretanica? *O. variegata*, *O. Hederæ*, Anagallis platyphylla, Euphorbia gibraltarica (endemic), *Pinus halepensis*, *Zannichellia macrostemon*, *Potamogeton americanus*, *P. pusillus*, Asphodelus serotinus (endemic), *Carex paniculata*, C. punctata, *Tragus racemosus*, *Aira multiculmis*, *Glyceria loliacea*, *Lepturus incurvatus*, *Isætes bætica* (endemic), *Polystichum Thelypteris*.

District III. Subdistrict ii. ALGECIRAS.—This subdistrict, of twelve and a half square miles, is the only one, except that of Gibraltar, which contains mountains of over 1000 ft. high. The range behind Algeciras is usually called the Sierra de Palma or the S. de Luna, but I have been unable to verify that these names are used locally, nor to which portions of the range they apply. Debeaux usually, though not invariably, writes of the S. de Luna as in the Los Barrios district, but they certainly lie south of the Palmones River, and are perhaps the northern end of the range. I have called the whole range, of which I have personally only worked the portion nearest to Algeciras, the "Mountains behind Algeciras," or simply "Mountains." They are mostly covered with cork and oak trees, with shrubs of the *Cistaceæ*, *Leguminiferæ*, and *Ericaceæ*, the undergrowth being ericetal. The valleys are well-watered, and produce many moisture-loving plants, but as the elevation increases the vegetation becomes more xerophilous, and nothing of an alpine or subalpine nature is found, unless *Corbularia Bulbocodium* be so classified. The lower hills about Algeciras and the higher ones towards Carnero Point have a somewhat similar flora to that of hills of the same nature about San Roque, but at Carnero Point species found elsewhere only on the Rock reappear, e. g. *Silene obtusifolia* and *Asteriscus maritimus*. There are sandhills at Sandy Bay, south of Algeciras, and from about a mile north of the town up to the Palmones River there are extensive sands, much of which is cultivated for vegetables. The river is tidal and its muddy shores support a few halophilous plants.

The subdistrict contains 950 species, about 120 of which do not occur elsewhere in our region. The following are not recorded from elsewhere in the province, those in roman type being unknown in Spain:—*Ranunculus flabellatus* v. acinacilobus? gregarius? and confertus (all endemic), *Fumaria arundana*, *Brassica lævigata*, Halimium formosum, Silene mogadorensis, *Silene nutans*, *Mœhringia pentandra*, Arenaria algarbiensis, Ulex luridus, *U. brachyacanthus*, *Ononis crotalarioides* (v. rubricaulis is endemic), *Melilotus alba*, *Trifolium filiforme*, T. Jaminianum, T. Juliani, *Tetragonolobus conjugatus*, *Lotus uliginosus*, *Vicia onobrychoides*, *V. bætica*, *V. disperma*, *Potentilla Tormentilla*, *Peplis Portula*, *Myriophyllum alterniflorum*, *Isnardia palustris*, *Sanicula europæa*, Bupleurum foliosum, *Opononax Chironium*, *Coleostephus Myconis*, Evax Cavanillesii, *Carduus nutans*, *Centaurea sempervirens*, *Leontodon hispanicus* var. psilocalyx (endemic), *Crepis corymbosa*, *Myosotis lingulata*, M. maritima? *Veronica persica*, Bartsia aspera, *Orobanche loricata*, *O. Rapum-Genistæ*, *O. Hænseleri*, Mentha Bauhini, *Salvia Sclarea*, Teucrium campanulatum? T. bracteatum (only near Tarifa), *Plantago amplexicaulis*? *Rumex Friesii*, Mercurialis Reverchoni (endemic), Orchis palustris, *Iris juncea*, Allium rubrovittatum, *A. Moly*, *Juncus foliosus*, *J. sylvaticus*, *J. supinus*, *Cyperus esculentus*, Rynchospora glauca, *Carex acuta*, *Arrhenatherum pallens*, Kœleria Salzmanni v. valdepilosa (endemic), *Holcus grandiflorus*, *Festuca montana*, *Notochlæna Marantæ*.

District III. Subdistrict iii. Palmones.—This is a small subdistrict, and I have only worked a small portion of it, namely about three square miles. On the coast is a broad stretch of sand dunes, with some damp hollows, the ground becoming muddy and saline towards its western end, which I have called the Palmones or Guadarranque Marshes. This is succeeded by a line of salt pans, separated from the sand dunes by a cultivated strip. North of this, again, there is an extensive freshwater marsh, which I have designated the Guadacorte Marshes. On the east the Palmones River, with its tributary the Aguacorte, has muddy banks which produce a few local species. Inland from the Guadacorte Marshes the country rises in undulating hills of a similar nature to those about San Roque, till the higher ground of the S. de Rompecoche or S. de Alcala is reached, but I have not explored this part, nor have I any records from it.

The subdistrict being a small one, containing 520 species; only sixteen, of which six are grasses, are known in it which are unrecorded from other parts of the region, but several others are very local elsewhere. The following are not recorded elsewhere in the province:—*Trifolium cernuum*, Astragalus algarbiensis, *Peplis erecta*, *Umbilicus pendulinus* v. truncatus (endemic?), *Erythræa spicata* v. glauca (endemic?), *Myosotis sicula*.

Geographical Distribution of Species.

It is hoped that the following arrangement will bring out the distribution of the species in a clearer manner than that adopted by Debeaux, though no selection of zones can be made which will

include all the species without allowing some elasticity. The majority of our species, as will be seen, reappear in North Africa, that is, either in Morocco or Algeria, although, in so far as Europe is concerned, many may be restricted to the Cadiz province, to our own region, or even to the Rock. Many others, although included in a defined zone, may also occur in some more or less isolated and often distant country, such as Egypt, Asia Minor, or even Siberia, so that they cannot strictly be regarded as peculiar to that zone, though they seem better placed to it than to any other. It would occupy too much space to detail all these outliers of the larger zones, so I have only detailed those of the smaller ones.

In general, I have only considered the distribution in Europe and North Africa, so that many of the species in zones 8, 10, and 11, may occur in Asia or even America, while many of those in zones 7 to 11 range as far as the Canaries. It will be seen that about 85 per cent. of our species reappear in North Africa, *i. e.* either in Morocco or Algeria.

Varieties of which the types do not occur within our limits are reckoned as species, otherwise they are not included except in the first four zones, nor are naturalized species nor doubtful records included. The percentages are calculated upon the number included in this enumeration, which slightly differs from the total known for the region, a few being omitted as fitting no particular zone, while several varieties are included.

Zone 1. Rock and North Front.—The species and varieties peculiar to the Rock are eight, or 0·6 per cent. of the total, viz. *Clematis cirrhosa* v. *Dautezi*, *Iberis gibraltarica* (also N. Africa), *Brassica sabularia* v. *papillaris*, *Saxifraga globulifera* v. *gibraltarica* (also N. Africa), *Helichrysum rupestre* v. *Boissieri*, *Senecio minutus* v. *gibraltaricus*, *Thymus diffusus*, *Salvia triloba* v. *calpeana*.

Cerastium Boissieri v. *gibraltaricum* is excluded, being found also in the Granada province.

Zone 2. The Limits of this Flora.—The following forty-two, or 3·0 per cent. of the total, are confined in Europe to our limits, viz. *Ranunculus flabellatus* v. *acinacilobus*, v. *gregarius*, and v. *confertus*, *Anemone coronaria* v. *micrantha*, *Fumaria sepium*, *Tuberaria variabilis* v. *brevipes*, *Reseda propinqua* (also N. Africa), *Silene mogadorensis* (N. Africa), *Genista Winkleri*, *Ononis Cossoniana* v. *rotundifolia*, *O. crotalariodes* v. *rubricaulis*, *Trifolium Juliani* (N. Africa), *Tetragonolobus pseudopurpureus*, *Vicia vestita* v. *tuberculata*, *Umbilicus pendulinus* v. *truncatus*, *Bupleurum foliosum* (N. Africa), *Œnanthe globulosa* v. *Kunzei*, *Lonicera implexa* v. *puberula*, *Pycnocomon rutæfolium* v. *bæticum*, *Bellis rotundifolia* v. *hispanica*, *Senecio Lopezii* v. *minor*, *Carduus myriacanthus* (N. Africa), *Leontodon hispanicus* v. *psilocalyx*, *Jasione rosularis*, *Erythræa acutiflora*, *Scrophularia laxiflora*, *Betonica algeriensis* (N. Africa), *Anagallis platyphylla* (N. Africa), *Rumex bucephalophorus* v. *perennans*, *Mercurialis Reverchoni*, *Euphorbia gibral-*

tarica, *Narcissus viridiflorus* (N. Africa), *Asphodelus serotinus*, *Rynchospora glauca* v. *pauciseta*, *Leersia hexandra* (N. Africa), *Paspalum Digitaria*, *Cymbopogon hirtus* v. *podotrichus*, *Agrostis alba* v. *fuscescens*, and v. *myriostachys*, *Koeleria Salzmanni* v. *valdepilosa*, *Melica minuta* v. *arrecta*, *Isœtes bœtica*.

A few are only found also elsewhere as stated:—*Ranunculus Winkleri* (S. de Mijas), *Ulex brachyacanthus* (S. de Mijas), *Trifolium Jaminianum* (S. Italy and Algeria), *Ferula tingitana* (Morocco and Orient), *Myosotis maritima* (Azores), *Teucrium bracteatum* (Tarifa and Morocco), *Statice spathulata* (Tarifa and N. Africa), *Allium rubrovittatum* (Crete), *Holcus grandiflorus* (Granada), *Festuca montana* (N. Africa, Estepona).

Zone 3. The Cadiz Province contains the following twenty-four of our species, or 1·8 per cent. of the total, only found therein, in addition to those in the above two zones:—

Ranunculus flabellatus, *Fumaria sepium* v. *gaditana* (N. Africa), *Biscutella scutulata*, *Halimium eriocephalum* v. *asperrimum*, *Tuberaria echioides* (N. Africa), *Rhamnus Frangula* v. *longifolia*, *Cytisus candicans* v. *Kunzeanus*, *C. tribracteolatus*, *Ulex Boivini* v. *megalorites* (N. Africa), *U. scaber* (N. Africa), *Ononis Tournefortii* (N. Africa), *Umbilicus citrinus*, *Prolongoa Pseudanthemis*, *Crepis tingitana* (N. Africa), *Tolpis barbata* v. *grandiflora* (N. Africa), *Linaria Munbyana* (N. Africa), *Satureia inodora* (N. Africa), *Salvia tingitana* (N. Africa), *Teucrium Scorodonia* v. *bœticum* (N. Africa), *Crocus Salzmanni* (N. Africa), *Molineria minuta* v. *bœtica*, *Corynephorus macrantherus*, *Trisetum Dufourei* v. *lasianthum*, *Vulpia Alopecurus* v. *sylvatica*.

The following almost fall into this zone, but occur outside the province in the additional countries mentioned, viz. *Diplotaxis siifolia* (Seville and N. Africa), *Erodium laciniatum* v. *involucratum* (Algeria and Sicily), *Spergularia fimbriata* (N. Africa and Canaries), *Linum decumbens* (S. Italy, Sicily, and Tunis), *Ononis filicaulis* (N. Africa and Estepona), *Vicia bœtica* (Malaga), *Pistorinia Salzmanni* (Jaen and N. Africa), *Pinardia anisocephala* (Palestine and N. Africa), *Hedypnois arenaria* (Huelva and N. Africa), *Salvia bicolor* (Estepona and N. Africa), *Armeria bœtica* (Estepona and N. Africa).

Zone 4. The Cadiz Province and Portugal, but not elsewhere in Spain, contains, in addition to those in zone 3, twenty-four species, or 1·8 per cent. of the total, *viz.*:—

Halimium formosum, *Silene longicaulis*, *S. gibraltarica* (N. Africa), *Arenaria algarbiensis*, *A. emarginata* (N. Africa), *Hypericum tomentosum* v. *lusitanicum*, *Ulex luridus*, *U. scaber* v. *glabrescens*, *Ononis pinnata*, *O. Cossoniana*, *Astragalus algarbiensis*, *Lœfflingia micrantha*, *Centaurea uliginosa*, *Rhododendron bœticum*, *Bartsia aspera* (N. Africa), *Pedicularis lusitanica*, *Salvia bullata*, *Statice diffusa*, *Romulea gaditana*, *Fritillaria lusitanica* v. *stenophylla*, *Agrostis Juressi*, *Trisetum Dufourei* (type), *Atropis iberica*, *Vulpia Alopecurus* v. *lanata*.

Outliers, elsewhere as well as Cadiz and Portugal, are:—*Silene obtusifolia* (Algeria and Canaries), *Ulex aphyllus* and

U. spartioides (Galicia), *Centaurea polyacantha* (Morocco and Valencia), *Erythræa grandiflora* (Sicily and Tunis), *Romulea Clusiana* (Algeria and Estepona), *Carex ambigua* (N. Africa and Balearic Islands), *Davallia canariensis* (Canaries).

Zone 5. South Spain, *i.e.* the whole of Andalucia, with the Province of Murcia and South Portugal, contains ninety-two species additional to the above, or 6·9 per cent. of the total, of which sixty-six are N. African.

Zone 6. Spain, with Portugal, the extreme south of France, and the Balearic Islands, contains one hundred species, or 7·4 per cent. of the total, of which seventy-two are N. African.

Zone 7. West Mediterranean, as far as Italy, with some outliers in Greece, contains 166 species, or 12·3 per cent. of the total, of which 144 are N. African.

Zone 8. Mediterranean, with Southern Europe, contains 372 species, or 27·5 per cent. of the total, of which 356 are N. African.

Zone 9. Western Europe, *i. e.* Britain, France, Spain, and Portugal, contains forty-three species, or 3·2 per cent. of the total, of which twenty-three are N. African.

Zone 10. Central, West, and South Europe, including species common to 8 and 9, but not enumerated therein, contains 234 species, or 17·3 per cent. of the total, of which 215 are N. African.

Zone 11. Europe contains 247 species, or 18·3 per cent. of the total, of which 238 are N. African.

Summary.

The number of species and varieties recorded in this Flora is as follows:—

	Dist. I.	Dist. II.	District III.				Whole Region
			Sub-dist. i.	Sub-dist. ii.	Sub-dist. iii.	Total	
Species enumerated ..	766	263	1095	1003	555	1349	1462
Deduct cultivated species, errors, doubtful records, and naturalized aliens ..	179	32	76	54	35	86	155
Total native species ..	587	231	1019	949	520	1263	1307

There are also about 260 varieties, exclusive of those reckoned as species. Where the type of a species is not found, its principal variety is reckoned as a species, not as a variety.

Of the total of 1307 species, 234 are not recorded elsewhere in the province, and sixty-six are not known elsewhere in Spain.

The species of these two categories, which are special to one district or subdistrict, have already been enumerated; those occurring in more than one are as follows. As in similar lists, those not recorded for Spain are shown in roman type, and a "?" indicates doubt as to the correctness of the inclusion of the species in the list, not doubt as to its occurrence. All doubtful records, and as a rule varieties, are omitted:—*Ranunculus Drouetii*, *R. blepharicarpus*, *R. Winkleri*, *R. ophioglossifolius*, *Matthiola sinuata*, *M. tricuspidata*, *Succowia balearica*, *Brassica Tournefortii*, *Reseda alba*, *Silene obtusifolia*, *S. vespertina*, *Sagina maritima*, *Alsine tenuifolia* (v. *hybrida*), *Cerastium brachypetalum*, *Spergularia purpurea*, S. atheniensis, *Geranium columbinum*, *Genista Hænseleri*, *Ononis repens*, *Melilotus elegans*, *M. messanensis*, *Trifolium subterraneum*, Tetragonolobus pseudopurpureus, *T. siliquosus*, *Lotus edulis*, *Rosa micrantha*, *Alchemilla arvensis*, *Epilobium Tournefortii*, *Herniaria incana*, *Illecebrum verticillatum*, *Sedum micranthum*, *S. Winkleri*, *Petroselinum peregrinum*, Bellis rotundifolia, (*Pulicariadyssenterica*) v. *hispanica*, Pinardia anisocephala, (*Senecio Lopezii*) v. minor (endemic), *Kentrophyllum arborescens*, Carduus myriacanthus, *Hyoseris scabra*, *Hypochæris glabra*, Erythræa acutifolia (endemic), *Convolvulus siculus*, *Echium maritimum*, Scrophularia laxiflora (endemic), *Orobanche Caryophyllacea*, *O. sanguinea*, *O. Picridis*, *Thymus vulgaris*, *Prasium majus*, *Centunculus minimus*, Statice emarginata (elsewhere only at Tarifa), Rumex thyrsoideus, *R. scutatus*, *Polygonum serrulatum*, *Euphorbia rupicola*, E. pterococca, *Callitriche hamulata*, *Salix cinerea*, *Alisma ranunculoides*, *Orchis cordata*, *Neotinea intacta*, *Spiranthes æstivalis*, *Epipactis atrorubens*, Limodorum abortivum, *Iris filifolia*, Narcissus viridiflorus, Ruscus Hypophyllum, *R. Hypoglossum*, *Ornithogalum pyrenaicum*, *Allium sphærocephalum*, *A. nigrum*, *Juncus capitatus*, *Luzula Forsteri*, Pycreus Mundtii? *Eleocharis multicaulis*, Fuirena pubescens, *Carex depressa*, *C. extensa*, *C. lævigata*, Leersia hexandra, *Phleum pratense*, *Chrysopogon Gryllus*, *Antinoria agrostidea*, *Corynephorus fasciculatus*, *Kœleria pumila*, Atropis iberica, *Schismus marginatus*, *Serrafalcus commutatus*, *Agropyron campestre*.

In addition to the species excluded, or marked with a sign of doubt in the Flora, the Appendix, or in this preface, the following should be looked for, as well as types of species of which only varieties are recorded, and varieties of many of the species. The names in brackets are those of the collectors who have recorded them from the neighbourhood, but with the exception of Kelaart's records I have only given those which seem likely to occur from the lists of others. Several names in Kelaart's list which do not appear here are synonymous with species already included elsewhere. His *Fumaria hygrometrica* is doubtless a misprint for *Funaria*, and *Carex marina* is *C. maxima*. The species followed by *P. L.* are those said by Perez Lara to be common in the whole province. I have not included the supposed finds of Dasoi, nor the North African species mentioned in Willkomm and Lange's *Prodromus* as likely to occur:—

Helianthemum villosum Thib. (*Schott*).
Cytisus albus Link. (*Schott*, as *Spartium multiflorum*).
C. patens L. (*Schott*).
Calycotome spinosa Link. (*K.*?).
Genista horrida DC. (*K.*).
G. hirsuta Vahl. (*K.*).
Adenocarpus intermedius DC. (*Schott*, as *Cyt. divaricatus*).
Ulex europæus L. (*Von Martius, Schott*).
Ononis monophylla Desf. (*K.*).
O. hispida Desf. (*Von Martius, Salzm.*).
Trifolium hirtum All. (*K.*).
Anthyllis onobrychioides Cav. (*Schott*).
Glycyrrhiza glabra L. (*K.*).
Hippocrepis ciliata Willd. (*K.*).
Onobrychis horrida Desv. (*K.*).
Poterium agrimonioides L. (*K.*).
Cratægus oxyacantha L. (*K.*).
Herniaria cinerea DC. (*K., P. L.*).
Cucumis Colocynthis L. (*K.*).
Pistorinia hispanica DC. (*Schott*).
Paronychia nivea Boiss. (*K.*).
Eryngium tenue Lamk. (*Schott*).
E. campestre L. (*P. L.*).
Pimpinella Anisum L. (*Von Martius*).
Viscum cruciatum Sieb. (*K., Frere*).
Rubia tinctorum L. (*Von Martius, &c.*).
Tanacetum annuum L. (*P. L.*).
Phagnalon rupestre DC. (*P. L.*).
Onopordon nervosum Boiss. (*P. L.*).
Picnomon Acarna Cass. (*P. L.*).
Carduus Reuterianus Boiss. (*P. L.*).
Scolymus grandiflorus Desf. (*Schott*).
Lactuca Scariola L. (*P. L.*).
Erythræa chloodes Gren. & Godr. (*Von Martius, Schott*, as *E. conferta*).
Cressa cretica L. (*K.*).
Nonnea nigricans DC. (*K.*).
Echium gaditanum Boiss. (*K.*).
Withania frutescens Pauq. (*K.*)
Mandragora officinalis L. (*K.*).
Scrophularia Scorodonia L. (*K.*).
Veronica saxatilis Jacq. (*K.*).
Euphrasia minima Schleich. (*K.*).
Lavandula latifolia Vill. (*K.*, as *L. Spica* DC.).
Thymus mastichinus L. (*P. L.*).
T. Zygis L. (*P. L.*).
Teucrium spinosum L. (*K.*).
Globularia Alypum L. (*P. L.*).
Anagallis collina Schousb. (*Von Martius, Schott*).
A. tenella L. (*K.*).
Limoniastrum monopetalum Boiss. (*P. L.*).
Plumbago europæa L. (*K.*).
Amaranthus viridis L. (*P. L.*).
Plantago albicans L. (*P. L.*).
Rumex Acetosella L. (*K.*).
Quercus Ballota Desf. (*P. L.*).
Salix purpurea L. (*P. L.*).
Juniperus phœnicea L. (*P. L.*).
Zannichellia palustris L. (*P. L.*).
Potamogeton natans L. (*K.*).
Phucagrostis major Cav. (*K.*).
Orchis saccata Ten. (*K.*).
Scilla verna Huds. (*K.*).
Muscari racemosum DC. (*K., P. L.*).
Merendera montana Lge. (*K.*).
Aphyllanthes monspeliensis L. (*P. L.*).
Cyperus hirsutus Salzm. (*K.*). Unknown?
Eleocharis acicularis R.Br. (*Von Martius*).
Phalaris nodosa L. (*P. L.*).
Anthoxanthum odoratum L. (*K.*).
Alopecurus pratensis L. (*Von Martius*).
Echinaria capitata Desf. (*K.*).
Phragmites gigantea Gay (*P. L.*).
Aristida cærulescens Desf. (*K.*).
Eragrostis megastachya Link. (*P. L.*).

Plan of the Flora.

As space has been an object, I have been obliged to make my remarks in the body of this work as brief as possible, having principally confined them to short notes which may be found helpful in distinguishing allied species. As already explained, I had not hoped for time to carry out much of the research work dealt with in this preface; consequently the resulting corrections have to be embodied in an Appendix instead of in the main body of the work.

The few synonyms cited are those names, or most of them, which have been used for the species in Debeaux's and Kelaart's Floras.

The months of flowering have presented some difficulty. They are mostly taken from my own observations, which I find to agree much more closely with those given by Perez Lara than with Willkomm and Lange's, which latter, of course, deal with the whole of Spain. Our own region, having so much milder a winter, naturally has a much earlier flowering season. Even on the Rock plants often flower from three to five weeks earlier than in the surrounding country. Some also flower almost the whole year round, or at irregular periods depending on the season, so an accurate flowering time is not easy to define. For those species which I have not myself seen in flower, I have quoted the months given by Perez Lara.

In giving the relative frequency of the species, I may have been in error in supposing that those which I have not myself found are rare; they are at least not likely to be common. The impression given by Debeaux is in some cases quite misleading.

The citation of other collectors is only given in the case of stations in which I have not myself seen the species, and is not always the oldest record, but a selection of what appears to be the most reliable from those given by Perez Lara or Debeaux.

The collection which I made is deposited in the Gibraltar Garrison Library, duplicates of nearly all the specimens of my first year's gatherings (to no. 1502) being in the Department of Botany of the Natural History Museum at South Kensington, and of the second year (no. 1503 to end) at Kew.

The collection having been made principally for local use, the localities given on my labels may, I fear, be not very clear to those unacquainted with the neighbourhood. The names for places in Spain can nearly all be found on the Hunting Map of Gibraltar, but have been used in a somewhat comprehensive sense. Thus, for want of any better name, I have called the whole of the area between the east foot of the Queen of Spain's Chair and the sea, "Bonel's Farm," while the west slopes more or less opposite San Roque I designate "Pindalista." Local names for precise localities are most difficult to obtain, and would probably be unintelligible to any one but members of the Calpe Hunt.

In conclusion, I must offer my best thanks to the several friends who have most kindly assisted me with the determination of the more difficult species. Dr. O. Stapf has named all my

grasses, Mr. Turrill the sedges, Mr. H. W. Pugsley the fumitories, and Prof. Beck the Orobanches. Valuable help in various genera and species has also been given by the Rev. E. S. Marshall, Mr. Arthur Bennett, Mr. G. C. Druce, Mr. J. Groves, and members of the staff at Kew and South Kensington.

I must also thank the Editor of this Journal for kindly granting me space to publish this Flora, failing which it would have been difficult, if not impossible, to bring it out in its present form at all, and for many suggestions.

I recapitulate for convenience of reference the numbers of the districts into which I have divided the region, and give a list of the conventional signs used, and the collectors' abbreviated names.

District I. The Rock itself, and the North Front, *i.e.* the whole British territory.
" II. The Neutral Ground.
" III. Spain, subdivided into—
Subdistrict i. San Roque, as far as the Guadarranque River.
" " ii. Algeciras, from the Palmones River to the Straits.
" " iii. Palmones, between the rivers.

* Denotes naturalized aliens.

† Denotes species or varieties not recorded elsewhere in the Province of Cadiz.

[ ] Denotes species which are excluded either as cultivated, casual, imperfectly naturalized, or incorrectly diagnosed.

? After a species or variety denotes doubt as to the correctness of the name, or after a station the occurrence of the species indicated in the station named.

! After a locality or a collector's name indicates that I have seen a specimen in that locality, or by that collector.

Collectors' abbreviated names are as follows:—

B. & R. = Boissier & Reuter.
Clem. = Clemente.
Clus. = Clusius.
Colm. = Colmeiro.
D. = Dautez.
Deb. = Debeaux.
Dur. = Durand.
K. = Kelaart.
Lem. = Lemann.
Lge. = Lange.
Nilss. = Nilsson.
P. L. = Perez Lara.
Pourr. = Pourret.
Rev. = Reverchon.
Salzm. = Salzmann.
Schousb. = Schousboë.
Wk. = Willkomm.
Winkl. = Winkler.

A. H. W.-D.

September, 1914.